

# THE IRON AGE

THE NATIONAL METALWORKING WEEKLY

August 17, 1950



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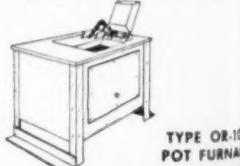
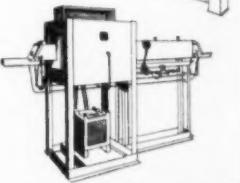
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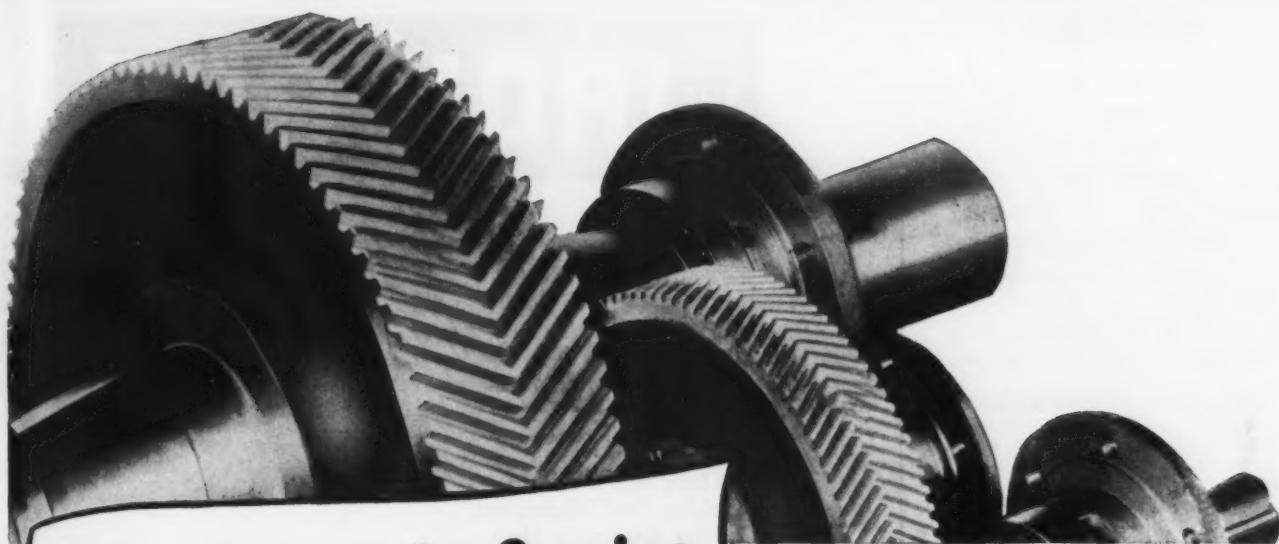
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THAT SHOULD APPEAL  
TO EVERY BUYER OF GEAR BLANKS

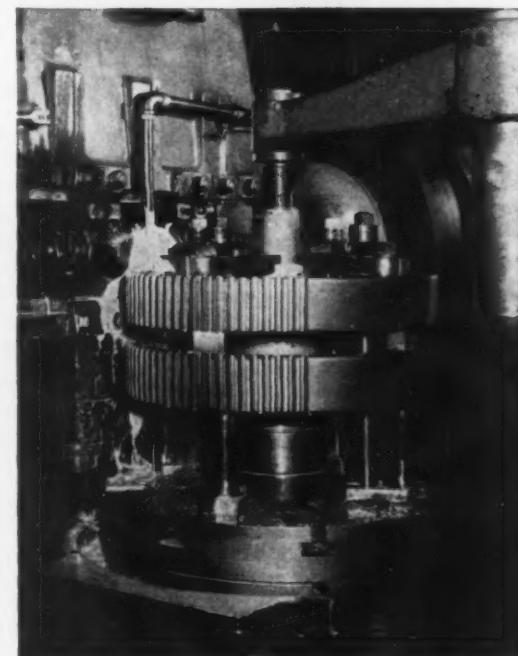
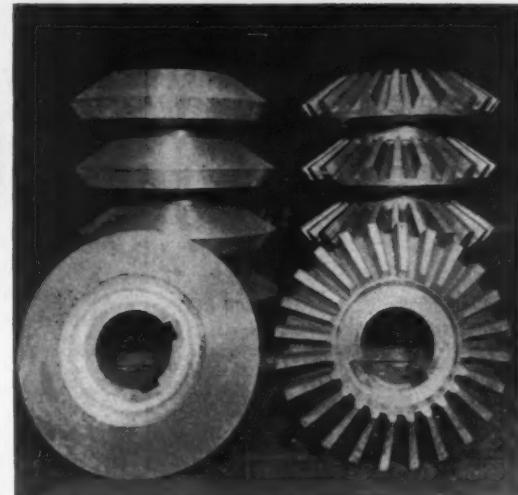
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Write for Booklet 216. It will tell you, and show by illustration, much more than we can do here. It's free upon request.



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August 17, 1950

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# THE IRON AGE

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Special Article



Continuous oxidation of high temperature steels, due to contamination by low metallic oxides of the protective oxide coating, has been stopped in laboratory work. Minimization of contamination and adjustment of alloy composition is the secret.—p. 85.

Issue Highlights



Though Brazil's richness in iron ore has been known for many years, the true extent of these ores is unknown and apparently will remain so for years to come. But changing economic conditions and possible new developments in steelmaking technology may change this picture radically within the next two decades. Part I of a two-part article.—p. 81.



The presence of sigma phase is responsible for the low corrosion resistance of austenitic stainless steels when tested in boiling 65-pct nitric acid. Control of aluminum content and of the chromium and nickel content can minimize the quality of sigma formed.—p. 91.



Bethlehem Steel Corp. has entered an agreement with a Brazilian firm for development of large manganese deposits in the lower Amazon Valley. Quantity exports are expected to begin in 1952-53. Deposits may total 10 to 20 million tons of 44 pct manganese ore.—p. 101.



The conflagration in Korea has started manufacturers in the Midwest on a wild race for supplies. Order dates have been advanced 30 to 60 days, and some companies are jumping a whole quarter ahead on critical items. Much of the buying is admittedly for "protection."—p. 103.



The break that came in scrap prices early in June seems to have been unjustified. Some circles now expect a \$50 a ton price, with a strong possibility of price controls. The mills have been trying to hold things down with little success so far.—p. 104.

Coming Next Week



Newest tool for automatic screw machines is an induction hardening coil. In an auto plant, machines fitted with hardening arbors turn bar stock into completely machined and hardened bearings... Cobalt<sup>60</sup> is becoming popular as a low-cost source of gamma rays for radiography. It may eventually replace the more expensive radium.

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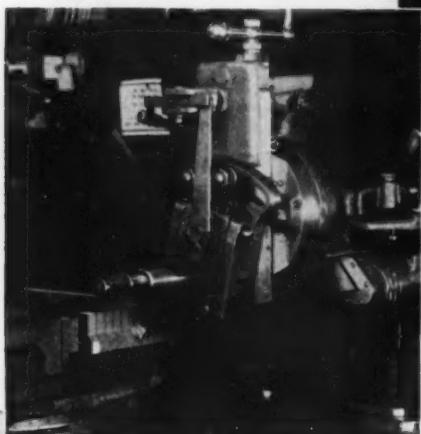
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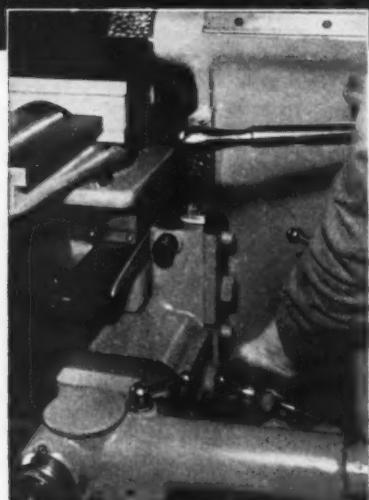
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RON AG August 17, 1950

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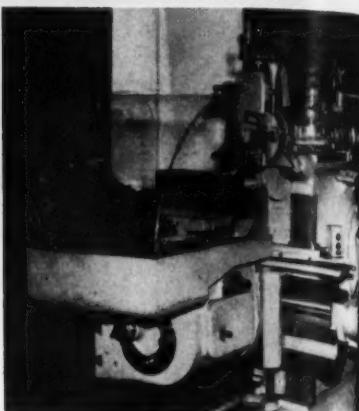
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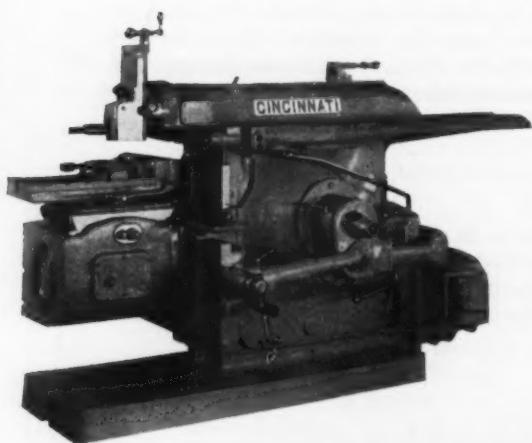
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# Editorial

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INDUSTRY VIEWPOINTS

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## Let's Not Kid Ourselves

WE have heard a lot on how we can do "business as usual" while we fight a war in Korea. That sounds good. But let's look at the facts.

The communists want the world. They don't want the American way. They don't want 23 flavors of ice cream. They don't want people to have the right to argue, fight, love or generally disagree with everything and everyone.

We are told we can have a grand boom while we are at war. We are told we can have our cake and eat it. We can't.

Let us now look again at what we face. We must give defense orders the right of way. This means other orders must take a back seat. How much of a back seat will turn up later. Meanwhile those orders are getting bigger every day.

If you knew a lot of arsonists were abroad in your city, would you pay more for a fire department? Of course you would. You would increase your taxes to the amount necessary to protect your home and family from inveterate fire starters.

We face the same thing from Russia. Let us dispense with the fine phrases and pussyfooting of politices and diplomacy. We face an enemy that sooner or later hopes to do away with capitalism.

Congress should know who is abroad in the world. But it has been crawling on industrial mobilization. Steel people were ready to roll up their sleeves to start on Government-supervised voluntary allocations weeks ago. That would have been a fast move and a good one. But they were held up week after week while Congressmen wrangled over maggoty details in the mobilization bill. That is not the kind of performance the people expect these days.

The real problem is—do we know what we face? Do we know what we must give up to protect what we have?

If we realize what we are in for in the years to come we will keep one eye cocked—always—on what communists are up to.

Let us not kid ourselves. This is an era when we will never know from one day to the next where we stand. Why not face it? And why not always think of our freedom first? Let's not be fooled by diplomacy or fancy talk. Let's look at the future as a tough job that has no quick and easy ending. Let's not be caught napping either at home or abroad.



Editor

10

## ways to keep a tight rein on

The variety of precision-built products shown here is representative of 10 different types of cost-saving small tools and equipment manufactured in complete ranges by Brown & Sharpe.

Each item has distinctive design and construction features that will help you hold a tight rein on your production costs. Some of the basic overall features include carefully selected materials, accurate workmanship with painstaking attention to details, and dependable performance. When all the features are added up, the results are products that are extremely versatile, easy-to-use, uniformly high quality and long-lasting . . . sound investments from every angle.

Whatever your requirements in this small tool and equipment field, you'll find a quality-built Brown & Sharpe product to meet them. Brown & Sharpe Mfg. Co., Providence 1, R.I., U.S.A.



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## NEWSFRONT

NEWS, METHODS AND PRODUCT FORECAST

- Although titanium is being tested for many aircraft applications, the first widely used part will probably be the compressor rotor of a jet engine. These parts are forged and machined.
- A blast furnace with an all-carbon lining has been designed for American use. The furnace shell is of all-welded construction to keep oxygen from the hearth area.
- Voluntary allocation of steel under government sponsorship will have little or no effect on steel shipments until October at the earliest. Reason is that delays in Congress make it impossible to start allocating anything earlier than fourth quarter steel shipments.
- Meanwhile there has been little scare buying from the big mills, though the effect of heavy consumer goods orders will linger for months. Since some mills will use October to clean up carryovers, it promises to be a hectic month.
- A recently developed multiplier phototube for use in scintillation counters is reported to be able to distinguish radioactive particles traveling 100 millionth of a second apart and to convert flashes into an electrical current amplified as much as a million times.
- It's started again—manufacturers renting Washington quarters for the representatives they feel sure they'll need to unsnarl the coming entanglements.
- Liquid metals may be used as coolants in nuclear chain reactors. They are better than water as heat transfer agents because their boiling points are higher. Also, liquid metals can be used at higher temperatures without a pressurized system.
- The key to successful hot extrusion of steel in one new process is the use of woven glass fiber. The glass becomes molten and acts as a lubricant at extrusion temperatures. (No further details can be made available now.)
- Bethlehem Steel has signed an agreement with a Brazilian firm for joint development (on a 49-51 pct ownership basis) of manganese deposits located in the lower Amazon Valley. Almost 4 million gross tons of 44 pct ore are said to have already been proved, with indications that a lot more may be available.
- Marginal steelmaking facilities are being groomed for production. Republic has reopened No. 3 (government-owned) melt shop at Canton; Columbia has leased steelmaking facilities (60,000 tons a year) of a government foundry at Pittsburg, Calif.
- Several of the hand sheet mills—killed off and given up for dead at least twice by steel industry experts, including The Iron Age—are making their annual comeback.
- A machine tool rental plan has been worked out in Philadelphia by a group that includes a machine tool distributor and a big commercial bank. The system, which does not include an option to buy, is designed to overcome the depreciation problem that has sorely taxed the machine tool industry for many years.
- Though passenger car orders spurted as a result of the war, the biggest jump has come in new truck buying. Where truck dealers were offering discounts the week before Korea hit the front pages it is now reported that premium offers to dealers are fairly common.



**Republic's  
Diamond  $\diamond$  Design  
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...are designed to exceed requirements of the first standard specification covering concrete bar deformations—"Minimum Requirements for the Deformations of Deformed Steel Bars for Concrete Reinforcement"—ASTM Specification A-305-49 adopted June, 1949.

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4	0.20	0.500	.668
5	0.31	0.625	1.043
6	0.44	0.750	1.502
7	0.60	0.875	2.044
8	0.79	1.000	2.670
9	1.00	1.128	3.400
10	1.27	1.270	4.303
11	1.56	1.410	5.313

**Republic**  
CONCRETE REINFORCING BARS



Forward Buying Snowballs

Defense Orders Expedited

Scrap Prices Explode Again

# The Iron Age

## SUMMARY

IRON AND STEEL INDUSTRY TRENDS

THE first waves of hysterical buying following the outbreak of war have been followed by a flood of orders that have just about jammed metalworking plants of all types. Purchasing agents have so clogged their suppliers doorsteps that it will take some time to sort out and evaluate the orders they are trying to place. Buying creates more buying. Here's how it works: John Jones doesn't want to be caught with his old refrigerator if there is another war, so he rushes down to the store and buys a new one. John's neighbor is impressed with his foresight and he hurries to buy one, too. But he is told that the store happens to be out of that model right now; thus the word gets out that there is a shortage of refrigerators. Meanwhile, the retailer has increased his order with the wholesaler, the wholesaler has increased his order with the manufacturer, and the manufacturer is trying frantically to increase his steel order with his supplier.

### Forward Buying Increased

This all happens because one man decides he had better buy a new refrigerator. And it works the same way on automobiles, sugar, and nylon hose. Of course, this example is oversimplified. But it aptly shows what is happening on the domestic scene—how scare buying snowballs.

Extended industrial forward buying is due to increased order backlogs of manufacturers and increased order backlogs of their suppliers.

Since the Korean war, leadtime on industrial purchasing has been stepped up 30 to 60 days. This applied to nearly all types of industries and materials.

Electric motors are being bought 4 to 6 months in advance of delivery, when formerly they were bought 3 months ahead. Steel bearings are being ordered through the first quarter of next year; ordinarily they would have been ordered only through the fourth quarter of this year. Some companies are placing orders for electronic parts 5 to 6 months ahead instead of 3 months ahead. Heavy chemicals (ammonia, muriatic

acid, nitric acid and caustic soda) are being bought 45 days ahead instead of 30 days ahead by companies that have adequate storage facilities.

This week all steel consumers can be divided into two groups—the hopeful and the fearful. Some are hopeful that they will receive the steel they need and some are fearful that they won't. But all are right in there battling for every ton they can get. In order to insure fair distribution of their products steel people are struggling mightily to screen and police every order.

### Contract Information Expedites Orders

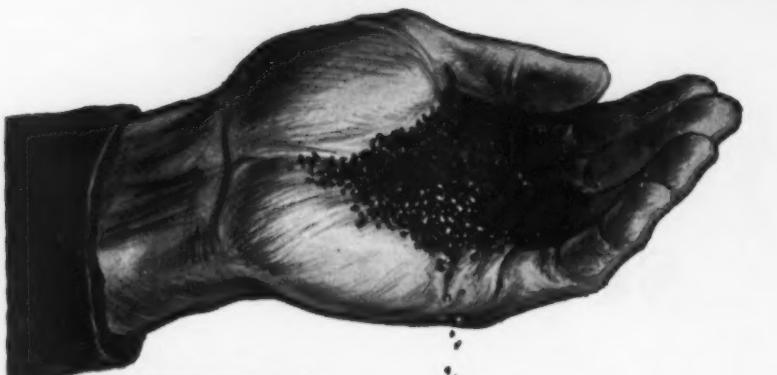
They have given up hope that machinery to handle voluntary allocations will be operating soon. And most of them are taking it upon themselves to expedite deliveries to customers holding government orders. They are asking customers to specify on the order the end use to which the steel will be put. If it is a government order they ask for the contract number; if a sub-contract, the name of the prime contractor and contract number. Customers are told they will get faster delivery when this information is supplied.

The curbstone brokers are working overtime on gray market deals, and some cold-rolled sheets have been sold for as much as \$260 to \$280 a ton. But the gray market can't make much headway in the face of its bad record in the past. Careful policing of orders leaves foreign steel as the best gray market source.

### Scrap Volcano Erupts Again

Scrap prices have again blown the lid off the market. For the second week in a row they have scored smashing advances. Gains scored this week have exploded THE IRON AGE steel scrap composite price to a point near the high for the year (see p. 142). Much of the strength in scrap prices stems from record steelmaking. Operations this week are scheduled at 100.5 pct of rated capacity, up half a point from last week's revised rate.

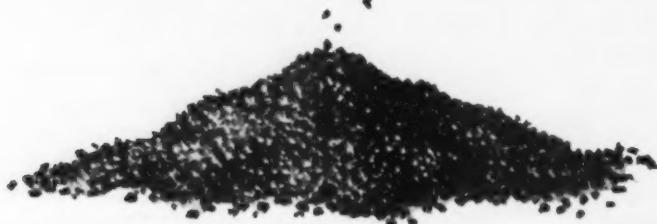
(Nonferrous summary, p. 140)



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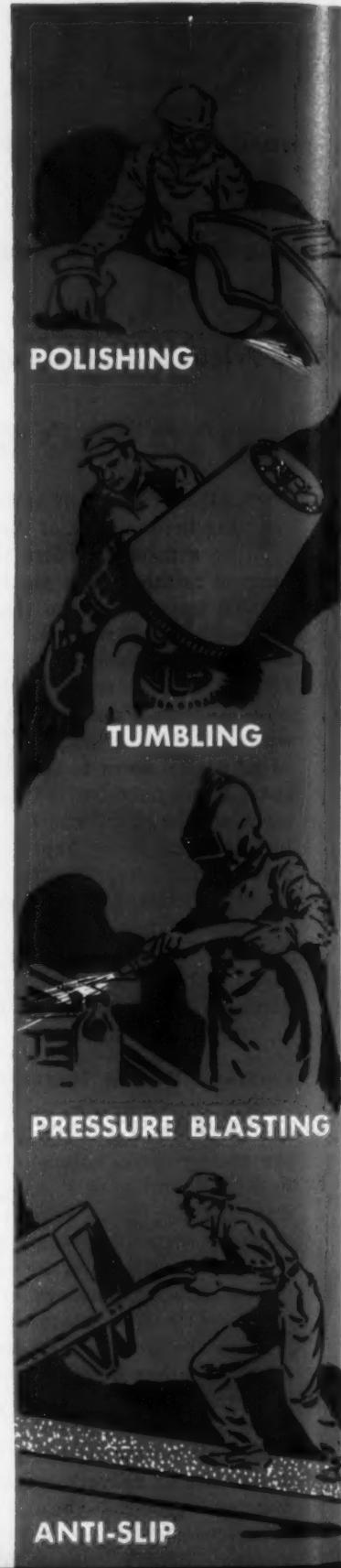
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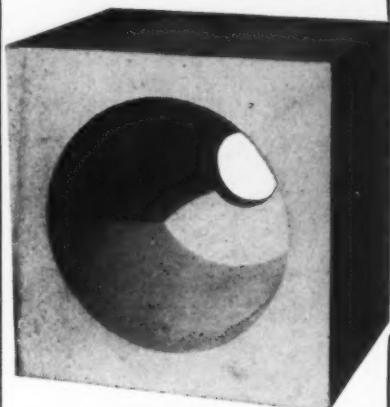
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## Everyone's Concern

Sir:

We have just seen in the European edition of *Newsweek*, an article on Russia's resources in which it is stated that THE IRON AGE has published some data on the steel production of Russia, compiled by Demitri Shimkin. We were not able to get the issue at the American Centre of Documentation, and would be very grateful if you could send us same as it would be very interesting for M. Jean Monnet's staff (on which I work) to see what details you have on that crucial problem.

MARIE DE NICOLAY Librarian

Présidence du Conseil  
Commissariat général du Plan  
Paris

"Steel Behind the Iron Curtain" is a comprehensive two-part article appearing in the Aug. 3 and 10 issues.—Ed.

## Send Him to Washington

Sir:

At last you have found someone is needed at Washington. Your editorial writer, T. C. Campbell, has all the answers, so why not recommend him to Mr. Truman to take care of us through the present crisis?

J. V. S. BISHOP

Bishop & Co.  
Philadelphia

## Popular Reprint

Sir:

Be kind enough to send me a copy of your reprint "The Metal Industry Takes to Powder." This was one of the most comprehensive and interesting articles on powder metals that has appeared in print for some time.

R. W. EDMONSON President

Metallurgical Service, Inc.  
Dayton

## Useful Literature

Sir:

The Norwegian Foundry Productivity Group under the leadership of John Sissener, Consulting Engineer of A/S Myrens Verksted, Oslo, Norway, is interested in a complete list of literature on the steel and iron foundry industry in the U. S. from recent years. Our group is in particular interested in receiving a copy of the book on foundry management, which was on display at the 1950 Foundrymen's Convention in Cleveland, in THE IRON AGE booth. Since

the writer of this letter will remain in the U. S. for some time, I have been asked by Mr. Sissener to compile such information, that will be of great interest to the group.

ROLF LANDMARK  
Mechanical Engineer

Allis-Chalmers Co.  
Milwaukee

A copy of The Iron Age Castings Manual has been sent with our compliments.—Ed.

## \$2 Million Typo

YOU SHOW WRONG FIGURES FOR SHARON PAGE 93 AUG. 3 ISSUE. SHOULD READ \$4,593,237 FOR FIRST HALF 1950 STOP GIVE US BACK OUR TWO MILLION.

H. A. ROEMER, JR.  
SHARON STEEL CORP.

Sorry about this whopping typographical error in our roundup of steel company earnings.—Ed.

## Croning Process

Sir:

We are very desirous of getting information on the Croning process of making molds and cores for foundry use. We have made a literature search and have been unable to find any references on this subject and, as a suggestion from Mr. Foster of the American Foundrymen's Assn., we are contacting you to see if you can give us any information on this subject.

V. PLESSCHER  
Research Director

Library of Industrial Research  
Chicago

The Aug. 3 issue of The Iron Age featured an article on the Croning process by our Detroit Editor, Walter Patton.—Ed.

## Who Makes It?

Sir:

Quite a long time ago I remember seeing a new type of patented coupling which, instead of joining the joints of pipe together, had a coupling which had slots drilled in the coupling itself. All you had to do was to drive a nail into these slots on the side of the couplings and it made a tight joint. Of course, they had rubber gaskets in the space where the two pipes joined inside of the coupling in order to make it water and air tight.

The nails on the side of the couplings were used like a wedge to hold the coupling, and to bear against the sides of the pipe. I do not remember where I saw this or what trade paper it was in. Can you tell me the name and address of the manufacturer of this type of coupling?

J. W. MOORE  
John Moore Specialty Co.  
Chicago

Dresser Mfg. Div. of Dresser Industries Bradford, Pa., makes a number of specialty couplings for plain-end pipe. Most of these are bolted, but they might be familiar with the type you describe. Perhaps one of our readers can supply information on this.—Ed.



## TWO MILLION TIMKEN ROLLERS *daily* ON NATIONAL COLD HEADERS!

● In the modern Gambrinus Plant of The Timken Roller Bearing Company, Canton, Ohio, National Cold Headers shown above are producing more than two million bearing rollers a day.

These dependable National Headers are important reasons why Timken rollers are able to pass

exacting dial-indicator inspections as to taper, length, and concentricity. Twenty-one Nationals produce more than 125 types and sizes of rollers from  $\frac{3}{8}$ -inch to  $1\frac{1}{4}$ -inch diameter wire.

Timken uses National Cold Headers because their operating features include accuracy, speed, versatility, and ruggedness.

*If you have a hot or cold forging problem, let us help you apply our experience toward its solution.*

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TIFFIN, OHIO.

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Chicago

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... by polishing cutting tool edges with DYMO. In the operation shown here, a diamond charged wheel (boxwood, 4-5,000 r.p.m.) is putting a fine polish on a carbide tool... in less time than required for a similar grinding operation. In actual tests, a DYMO polished cutting edge extends tool life 2 to 7 times between grinds.

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Elgin Dymo works faster and goes farther because precision graded particles of pure diamond, assisted by an exclusive Elgin vehicle, do the cutting. Elgin Dymo excels in actual shop convenience, too! It comes ready to use, each grade distinctly colored for instant identification, and it is universally soluble to simplify clean-up after polishing.

See how Elgin Dymo... available in 11 Bureau of Standards grades for any lapsing or polishing job... will reduce your finishing costs and give you better results at the same time. Just mail coupon below for a free demonstration right in your own plant!

---MAIL THIS COUPON TODAY---

Yes, I'd like to see how DYMO can help extend cutting tool life.

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POSITION \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ ZONE \_\_\_\_\_ STATE \_\_\_\_\_

INDUSTRIAL PRODUCTS DIVISION  
ELGIN NATIONAL WATCH CO.  
ELGIN, ILLINOIS



## Fatigue Cracks

By CHARLES T. POST

### Pan Europa

The Schuman plan to pool Western Europe's steel industry is under subtle attack in Britain if we believe a report passed along by F. H. Harley, your favorite family journal's London correspondent. He quotes the Manchester *Guardian* as alleging that, following a conference of economists, the charwomen cleaned up bushels of scratch paper, most of it covered with abstruse formulae and calculations. Amidst the mathematical doodles, though, were two significant comments:

"TO ERR IS SCHUMAN!"  
"MONNET IS THE ROOT OF ALL EVIL!"

### In the Can

Your f.f.j.'s circulation records have just undergone annual audit by the Audit Bureau of Circulations, whose auditors are a cut stiffer than bank examiners or financial auditors. When the auditor demanded proof of the business and occupation of each subscriber, he nodded acceptance of all classifications until he came to the subscription addressed to "Sing Sing Prison, Shop No. 7, Ossining, N. Y."

"This," he crowed triumphantly, as though he had uncovered a defalcation of \$100,000, "you have classified as a manufacturer of metal products. How come?"

The circulation department girls cringed momentarily as he put in a long distance call to check up.

"Sure," said Sing Sing, "we're a big manufacturer of ash cans."

### Commentary

There's a certain breed of industrial magnate who loves to air in print his views on everything from the Korean situation to Gussie Moran's lace panties. And there's another type so mum he wouldn't comment on today's weather.

When *Hardware Age*, your f.f.j.'s sister publication, wrote to Type No. 1 the other day to get his slant

on the supply situation, they received a short reply from the tycoon's secretary:

"I'm sorry to inform you," she wrote, "that Mr. \_\_\_\_\_ is on vacation and hence is unavoidable for comment."

### Puzzlers

We're merely passing along to H. C. Barnes the threat from "An Anonymous Pennsylvania R.R. Reader" that accompanied a solution to the Barnes ladder problem of August 3: "Tell Mr. Barnes the answer is 7.078855 ft. and I hope he chokes." We deduce from that a long exasperating struggle in which the reader was tempted to toss himself in front of one of the Pennsy trains. Paul W. Zimmer of Republic Steel solved it without any trouble; so did C. E. Blass, E. J. Sampson, Howard Fancher, B. B. Hood, and Robert H. Mahon.

Fancher also came up with an "approximate" answer to the July 27 puzzler (cow grazing inside circular 1-acre field; how long should rope be to give 10,000 sq. ft. grazing area). He gets 88 1/16 ft., and if you'd like to know how he figures it we'll send a copy of his work sheet on request. An unidentified researcher from Armour Institute submits a more exact method, requiring reference to a standard equation for numerical solution, and we'll send that, too, if you like.

D. W. Knipe of Mesta has the answer to the July 13 shopping expedition and C. M. Williamson and L. V. Jewell finally saw the June 29 issue and worked the original cow problem.

Try this one, submitted in similar form by Republic's Zimmer, A. C. Wilcox of New York, and J. C. Severn of Toledo Pressed Steel:

Two buildings on a street have parallel walls. From the base of the first building there is a 60 ft ladder leaning against the wall of the second building. From the base of the second building there is an 80 ft ladder leaning against the first building. The two ladders cross 20 ft. above the street. How far apart are the buildings?

# MACHINE TOOL

## High Spots

*Sales  
Inquiries  
and Production*



By W. A. LLOYD

**Fall from Peak**—A drop in new order volume during the past 10 days, evidence perhaps that the bulge is tapering off on coverage in the domestic market as a result of the new prices and extended deliveries, was reported by industry sources this week.

Indications are that July order volume, which was about double June business, will mark the peak of an upturn which has been under way since early spring. In the past, price increases have usually squeezed in a certain amount of business, which is followed by a period of reaction and reduced order volume.

The industry's July volume was notable, however, in that its general effect on the machine tools industry was like that of a major industrial expansion. The business went everywhere, and for the first time since the end of World War II, every company participated in the upsurge.

**Didn't Follow Trend**—The machine tool industry has not gone along with other industries since 1933, and particularly since the

end of the war, when with other industries setting new peaks, the machine tool builders were in the doldrums. In the past 6 months, the machine tool industry has shared in the general industrial pick-up.

Some sources see in the small decrease in new order volume proof that defense orders have not yet seeped down to the machine tool industry. None of the price increases, it is argued, would make any difference in defense buying, and that the present boom is the result of planning which antedated the present war in Korea.

**Reserve Pool Sacred**—The word from Washington is that military requirements for machine tools are still in the discussion stage. However, it is understood that firms receiving defense orders are expected to buy any needed tools which they do not already have. Tools in the reserve or stand-by storage will not be released to industry except upon a declaration of emergency by the White House or a War Declaration by Congress.

However, if it is found that lack of special equipment would bottleneck production lines, the needed tools would be released from the reserve on a loan basis until such time as the machinery could be obtained through normal channels of trade.

According to reports, only one major aircraft company and one other manufacturer have thus far drawn from the government reserve.

**Booked Far Ahead**—In Detroit, the probability that both 1950 and

1951 will be years of high volume for the machine tool industry is seen here as a result of the flood of commercial orders that have been placed or are now in process in this area. Most builders of machine tools find themselves booked for a year to a year and a half in advance.

In the face of great uncertainty about materials and prices, escalator clauses are going back into many of the local tooling contracts.

Up to the present time, direct buying for ordnance projects is light but indirect purchases have undoubtedly been made. Some large placements by Continental Motors, presumably for tank engines, are anticipated.

**Swamping Possible**—In light of present conditions, if the Military Aid Program (MAP), requirements should be placed, the machine tool industry would be swamped. First machines for MAP were quoted on more than a year ago, when backlog were negligible.

Deliveries now at major suppliers are extending to 9 months. Add to this the possibility that the military people may come up with some requirements of their own, and the case for priorities would suddenly become pressing.

**Price Spread Restored**—Developments of the past month have had repercussions in the foreign market. Price increases have restored the spread between U. S. and foreign builders, and deliveries, which were once a clincher for U. S. builders, have extended to the point where they are longer than the British and German, the principal competitors.

Inquiries are still being received from automotive, farm implement, electrical industries and gear manufacturers, plumbing goods producers, shipbuilding, diesel engine and railroad equipment producers overseas, but much of this potential volume is not expected to turn into orders without serious stimulation by the U. S. Government. What would do it is a repetition of the Korean affair in Yugoslavia, or some other critical point to shove MAP into high gear.

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## PUBLICATIONS

### **Rolling Mill Machinery**

Machinery for blooming, slabbing, and billet mills; merchant, bar and structural mills, rod mills, sheet and strip mills, plate mills, tube and pipe mills, rail mills and special custom-built equipment is covered in a new 30-p. catalog. In addition, it contains diagrammatic layouts showing the design and construction of complete mills. Although all machinery is built to meet customers' requirements, the many illustrations show the variety of products designed and built by Birdsboro for the steel producing industry. These include equipment ranging from ingot strippers to slab shears in the blooming mill, with special attention given to small, high speed reversing mills for use with lighter ingots. *Birdsboro Steel Foundry & Machine Co.*

For free copy insert No. 1 on postcard.

### **Industrial Air Heaters**

The new Olson Series 50 industrial type warm air heaters, designed primarily for heating and ventilating industrial and commercial buildings, are described in an 8-p. bulletin. Improvements have been made on the control panel, induced draft fan and external design. *Arthur A. Olson & Co.*

For free copy insert No. 2 on postcard.

### **Shovels and Cranes**

Lorrain-TL series power shovels and cranes are described in a new 18-p. catalog. The interchangeable units for packaged assembly are graphically illustrated in a series of phantom and built-up views. *The Shovel Co.*

For free copy insert No. 3 on postcard.

**New publications that describe money saving equipment and services are available free and without obligation. Copies can be obtained by filling in the attached card and mailing it.**

### **Anti-Corrosion Paint**

Facts about Tygon paint are presented in a new 12-p. bulletin. It tells where and how to use this corrosion-resistant paint and where not to use it. The corrosion-resistance tables, based almost entirely on field experience, are unique in their completeness. *U. S. Stoneware Co.*

For free copy insert No. 4 on postcard.

### **Stainless Valves, Fittings**

Engineering drawings, weights, dimensions, size ranges, materials, corrosion data, nomenclature and design information are woven into an attractive new 48-p. catalog on Cooper Alloy stainless steel valves, fittings and accessories. The complete line of stainless steel, nickel and monel gate, globe, angle, needle, Y, check, tank and other valves; screwed, flanged, welded and forged fittings; flanges, gages, pet and plug cocks, hose fittings and other accessories, is illustrated and discussed. *Cooper Alloy Foundry Co.*

For free copy insert No. 5 on postcard.

### **Temperature Guide**

The design and process engineer's guide to industrial temperature measurement and control is a new 24-p. booklet correlating dollars and degrees. The booklet lists

the eight different ways of responding to temperature and then discusses five ways of putting temperature response to work. Nine basic types of Partlow elements for mercury-bulb instrumentation are described and illustrated. Other sections of the booklet deal with the influence of heat sources on control systems; circuits and piping arrangements and calibration of scales and dials. *Partlow Corp.*

For free copy insert No. 6 on postcard.

### **Surface Grinders**

Several models of Taft-Peirce precision and rotary surface grinders are shown in a new 16-p. catalog on accessories. Attachments such as the vernier fine-feed, index grinding fixture and T-P grinding spindle are described and illustrated along with magnetic chucks and gage blocks. *Taft-Peirce Mfg. Co.*

For free copy insert No. 7 on postcard.

### **Drawing Reproduction**

A new 16-p. booklet describes photographic materials and methods for improving the legibility of reproduced engineering drawings and business documents. Information is provided on reproduction of tracings, blueprints, and opaque drawings on paper, film and cloth. Specialized recommendations describe

Turn to Page 122

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# NEW

## PRODUCTION IDEAS

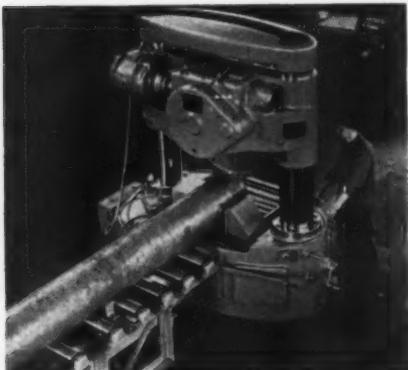
*Continued*

lens of pressure, temperatures and corrosion are factors. They are suited for applications of control devices and instrumentation such as regulators, valves, steam traps, shaft seals, expansion connections and flexible connectors for misalignment. Bellows are manufactured in single and multi-ply construction and various lengths. They can be supplied with standard or special fittings. *Chicago Metal Hose Corp.*  
For more data insert No. 25 on postcard, p. 37.

### Cold Sawing Machine

**Cutting force at greatest point of resistance within a rigid frame.**

The basic design of the Ohler hydraulic high speed cold sawing machine is such that the cutting force is directed vertically against the greatest point of resistance within a rigid frame. The absolute center location of the saw axis, re-



inforced by a heavy outboard bearing, provides balanced rigidity for chatter-free operation. A constant pressure hydraulic feed system adapts itself within the predetermined cutting pressure limits to the cutting resistance of the material, assuring maximum rate of feed at all times. Feed can be regulated from 0 to 20 ipm. The operating cycle on this machine, exclusive of actual cutting time, ranges from 6 to 25 sec and changing saw blades requires less than 1 min. Capacities of the cold saws are: Model 1000, rounds 15 $\frac{3}{4}$  in., squares 14 in., channels and I

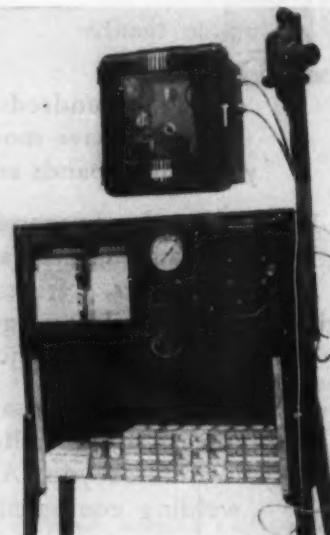
beams 24 in.; Model 660, rounds 10 $\frac{1}{4}$  in., squares 9 $\frac{1}{2}$  in., channel and I beams 16 in. *Klingelhofer Machine Tool Co.*

For more data insert No. 26 on postcard, p. 37.

### Flame Controller

**Determines end point and controls carbon in Bessemer converters.**

A new electronic flame control instrument is reported to make the operation of Bessemer converters a



simple matter with high technical accuracy in determining the end point and controlling the carbon. The instrument enables the operator to definitely determine the silicon, manganese and carbon periods and forewarns the operator of impending manganese boils, that reduce loss of metal and time. The correct end point is established eliminating excessive iron oxide. Two dual speed chart recorders give permanent records of air and flame characteristics, making duplication of blows possible. The instrument is equally applicable to side blow or bottom blow converters. *Whiting Corp.*

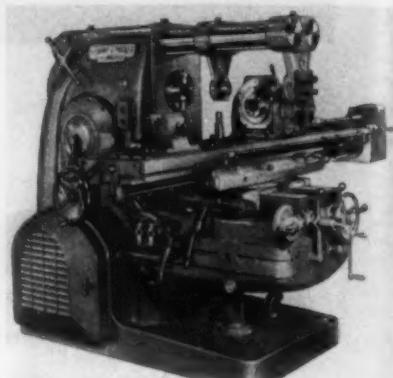
For more data insert No. 27 on postcard, p. 37.

### Milling Machines

**General purpose knee type, in plain and universal styles; five sizes.**

Principal features of the new group of machines, designated as Model CK, include: Newly de-

signed columns, heavier by 1000 to 1200 lb depending on machine size; spindle mounted flywheel, running with three-bearing support; heavy duty table feed screw, extra long bronze nut, and positive backlash eliminator; increased



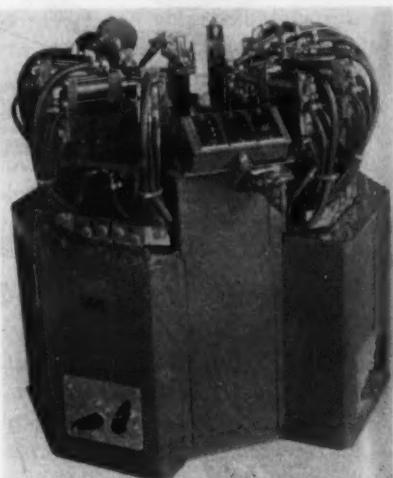
horsepower ratings, coupled with independent motor drives for spindle and for feed and rapid traverse. Feed changes from  $\frac{1}{8}$  to 90 ipm are provided on all machines, and 24 spindle speed changes. Lubrication is principally automatic through a forced flood system in the column and knee and a positive metered, pressure pump system for the table, saddle and knee ways, and table feed assembly. *Kearney & Trecker Corp.*

For more data insert No. 28 on postcard, p. 37.

### Table-Top Welder

**Welding cycle completes 10 welds in one operation on mixer bases.**

The machine is basically a table-top welder with ten adjustable self-centering welding guns and five



series welding transformers rated 35 kva at 50 pct duty cycle. An electronic control cabinet is mount-

**Turn to Page 126**

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# Iron Age Introduces



LEE O. WITZENBURG, named general sales manager of Cleveland Worm & Gear Co. and its subsidiary, Farval Corp.



L. C. DANIELS, appointed vice-president in charge of material handling division for Buda Co., Harvey, Ill.



DAVID R. MESLANG, who becomes manager of the Seattle branch of Crucible Steel Co. of America.

**B. N. Brockman, Jr.**, former advertising and export manager of the R. K. LEBLOND MACHINE TOOL CO., has taken up new duties as sales manager of the OLIVER H. VAN HORN CO., Houston.

**Blaine F. Fairless**, son of Benjamin F. Fairless, president of U. S. Steel Corp., has been promoted to sales manager of the STEEL CITY ELECTRIC CO. Mr. Fairless joined the company in April, 1949, and worked in the plant studying production and merchandising methods. He was then made assistant sales manager.

**J. F. Kuzmick** has resigned from EKSTRAND & THOLAND CO. to become president of the recently organized WELDED CARBIDE TOOL CO., Clifton, N. J., and also to organize his own consulting business in the powder metallurgy field.

Appointed sales managers for the Edgar T. Ward Div. of SOLAR STEEL CORP. were Walter F. Mills, Cincinnati, and Harry D. Curtis, Detroit.

**Arthur B. Tesmen** has been appointed sales engineer for the TEM-PIL CORP.

Appointments announced by KEN-NAMETAL, INC., Latrobe, Pa., include: **Floyd Montieth**, representative in the Chicago office; **Robert Karakoosh**, representative in the Springfield office; **William Collins** and **Harold D. Killmer**, service engineers in the Springfield office; and **Conrad Seim**, service engineer in the Los Angeles office.

**Milton L. Weislogel** has been named assistant to the general superintendent of the Gary Steel Works, CARNEGIE-ILLINOIS STEEL CORP. **Frank A. Kelly** succeeds Mr. Weislogel as plant industrial engineer.

**M. W. Sledge** was named to replace the late **E. W. Stephens** as manager of the belt sales department at the GOODYEAR TIRE & RUBBER CO.

**Robert E. Daly** becomes manager of the NATIONAL RADIATOR CO.'S newly opened Pacific branch office in San Francisco. **Herbert Van Kuran** joined the Pacific branch sales staff as the successor to Mr. Daly in Seattle.

**R. A. Dittbrenner** becomes eastern representative for the CARBOLINE CO. of St. Louis. Mr. Dittbrenner has been employed in corrosion work for the past 17 years.

**William J. McKee**, formerly sales manager, central area, has been appointed general manager of sales of NATIONAL TUBE CO., and **Louis W. Mason**, formerly assistant to general manager of sales, has succeeded Mr. McKee as sales manager, central area.

**G. W. Warnick** has been elected vice-president in charge of operations for NORTH AMERICAN REFRactories CO., Cleveland.

**Ronald K. Evans** has been elected executive vice-president by the board of directors of GENERAL MOTORS CORP. Mr. Evans has been vice-president and group executive in charge of the general engine division. He is a director of the company and a member of the operations policy and administration committees.

**George M. Burrier** has been appointed assistant general superintendent of the Midland Works of CRUCIBLE STEEL CO. OF AMERICA. Mr. Burrier succeeds **M. J. Meinen**, who has resigned to take a position with another company.

**Richard E. Pilling** was assigned to assist **F. M. Shelley, Jr.**, general sales manager of the RIVERSIDE METAL CO., Riverside, N. J.

**T. J. George** has been appointed district sales manager in Philadelphia for the SAWHILL MFG. CO., Sharon, Pa. **D. M. Middleton** will represent the company in western Pennsylvania, West Virginia and Ohio, with headquarters in the home office at Sharon.

**Lewis B. Case** has retired from the industrial hygiene department of GENERAL MOTORS RESEARCH LABORATORIES. His retirement marked the end of a 39 year research career with General Motors.

**Ivan E. Howard** has been named regional supervisor for the CLARK EQUIPMENT CO.'S industrial truck division in the south central territories. He is headquartering in Peoria.

**D. Gray Weaver**, formerly in the product development laboratory of the ACHESON COLLOIDS CORP., Port Huron, Mich., has been transferred to the Newark office to assist in the co-ordinating of technical and research problems.

**Raymond H. Hartigan** was appointed manager of the laboratory section of the central research department of KOPPERS CO., INC. **Gordon Black** was named assistant manager of the development section and **Peter W. Sherwood**, manager of the engineering branch of the development section of the research department.

**Douglas A. Kuhna** was appointed chief engineer of J. N. FAUVER CO., INC., Detroit.

**J. H. Bridenthall**, former production manager of BURROUGHS ADDING MACHINE CO. in Detroit, has been appointed assistant general manager of the paper products division.

**William W. Dulmage**, power consultant for FORD MOTOR CO., has retired after 36 years of service with the company.

**John A. Mulheren** was named to the newly created position of advertising manager for H. K. PORTER CO., INC., Pittsburgh. He was formerly manager of sales promotion and market research for chemical engineering and food industries magazines.

**Harold R. Lucas, Jr.**, was made an assistant to the general sales manager in the general sales department of HYSTER CO., Portland, Ore. **Henry Benit** was put in charge of Hyster demonstrations.

## Iron Age, *Salutes*

BENNETT S. CHAPPLE, JR.

**"BEN" CHAPPLE**, assistant vice-president—sales, U.S. Steel Corp. of Delaware, is one of the easiest guys in the world to talk to. A salesman himself, he relishes a good sales talk from the other side of the desk. He will listen, and he's willing to be convinced. But it's got to be good. Appeals to emotion or tradition leave him cold. Better lay it on the line, brother, or you're wasting your time—and Ben's, too.

With Ben there are no sacred cows. Just because something has been done in a certain way in the past is not necessarily a good reason why it should continue to be done that way. He's open to any and all suggestions for a better way.

Ben should make a good president for the National Industrial Advertisers' Assn., a position he will hold during the coming year. He's a bear for work, and has plenty of good ideas for advancing the prestige of NIAA.

Ben was particularly proud of the honor conferred upon him by NIAA. Apart from the natural ambition to head such a fine group, he also had a very personal reason. His dad was elected president of NIAA 25 years ago. The careers of father and son have run parallel in many respects. Ben, Sr., is assistant to the president of Armco Steel Corp., Middletown, O.

Born in Brooklyn, May 18, 1904, Ben Chapple, Jr., went to work for



Armco after his graduation from Antioch College in 1927. He joined the sales department of Carnegie-Illinois Steel Corp. as manager of sales promotion in 1936. He left the company in 1944 to become assistant to the president of Firth Sterling Steel Co., but a year later he joined the staff of the vice-president in charge of sales, U. S. Steel Corp., and was appointed to his present position in February, 1947.

When he gets the chance, Ben likes to play a round of golf (he shoots in the low 80s) and enjoys fishing off Georgia Bay, Ont. He's president of the Iron City Fishing Club, a group of Pittsburgh district anglers. He's a putter around the house—even takes a crack at doing his own plumbing work.



FLOYD DURHAM, elected vice-president in charge of production of Caldwell Industries, Inc., Kent, Ohio.

**H. Copper Kinney** was named director of purchases of REPUBLIC SUPPLY CO. R. E. McCullough will continue in his position as purchasing agent. Mr. Kinney was formerly manager of Republic's Gulf Coast district with headquarters in San Antonio. **I. R. Knight**, formerly Mr. Kinney's assistant, succeeds him as district manager.

Newly named sales representative to ALLIS-CHALMERS' West Coast offices are: **Edward E. Wilson** and **Ronald D. Brown**, Portland; **David H. Holmes**, Seattle; and **James V. Miller**, Spokane.

**Paul R. Hartig**, formerly assistant superintendent of GENERAL ELECTRIC'S Holyoke, Mass., factory, has been named manager of the G-E Oakland, Calif., transformer plant.

Officers elected by CONE AUTOMATIC MACHINE CO., INC., Windsor, Vt., are: **H. P. McClary**, chairman of the board; **H. P. Chaplin**, president and treasurer; **J. A. Gerard**, vice-president in charge of sales; **L. L. Cone**, vice-president, and **A. B. McClary**, secretary.

**Julius F. Sachse** has been elected vice-president and **Mary Sohayda**, secretary, of the METALS DISINTEGRATING CO., INC., Elizabeth, N. J.

**W. Samuel Carpenter, III**, has been appointed assistant manager of DUPONT CO.'S rayon department planning division.

**Charles N. Chalfant** was named industrial service representative in the metropolitan New Jersey area for the OPTIMUS DETERGENTS CO., Matawan, N. J.

## Iron Age Introduces

Continued from Page 69

**Albert Sobey**, president and only director in the history of the GENERAL MOTORS INSTITUTE, has been named president emeritus in consultant on special assignment. **Guy R. Cowing**, who has been associated with the Institute as assistant director since its inception, has been named president and director of the school, central training agency for GENERAL MOTORS and located at Flint.

**E. H. Ulm**, formerly sales engineer for the electronics division, SYLVANIA ELECTRIC PRODUCTS, INC., has been named merchandising manager.

**Ernest C. Shaw**, consulting engineer of ALLIS-CHALMERS' wood processing machinery section, has retired after more than 47 years of accumulated service with the company.

**J. F. Collins** was appointed New England sales representative by the NICKEL CADMIUM BATTERY CORP.

**H. G. Sixt** has been named technical assistant to **Fred P. Hauck**, vice-president of the MICHIGAN ABRASIVE CO. Mr. Sixt is a former Carborundum process engineer.

**James E. Reagan** was appointed assistant manager in charge of sales promotion and advertising for the WARD LEONARD ELECTRIC CO., Mount Vernon, N. Y.

**Roger E. Mitchell** has been promoted to general master mechanic at the BUICK MOTOR DIV. plant at Flint.

**William Godley** becomes manager of contract sales for PEABODY ENGINEERING CORP., N. Y. **George E. Smith** is manager of the air heater division and **Edward R. Clark**, manager of the automatic oil burner division.

**Gerald F. Twist** was elected a vice-president of the FOOD MACHINERY & CHEMICAL CORP., San Jose, Calif. Mr. Twist is manager of EMC'S Peerless Pump Div., with major plants at Los Angeles and Indianapolis.

**John P. Conde** was made advertising and sales promotion manager of the Brady-Milwaukee Div. of W. H. BRADY CO., Chippewa Falls, Wis.



LOUIS DeMARCO, appointed sales engineer, carbide division, for Firth Sterling Steel & Carbide Corp.

**George F. Brobyn** was made night superintendent of the main plant of SKF INDUSTRIES, INC., Philadelphia. **Emil Nagel** has been named assistant general foreman in charge of grinding and **K. J. Baird** has been appointed to the same position in charge of assembly, capping and packaging.

**John C. H. Wendes** has been appointed production manager of the Naugatuck Chemical Div., U. S. RUBBER CO.

**Frank Frable** was appointed sales representative for the NICKEL CADMIUM BATTERY CORP.

## OBITUARIES

**Harry F. Idzkowsky**, pioneer safety director, passed away recently in Pittsburgh. He had been associated with the Mine Safety Appliances Co.

**Ralph J. Wiemer, Sr.**, assistant general sales manager, Lamson & Sessions Co., died recently. He was 54.

**Harold S. Arnold**, technical assistant to the president of the International Nickel Co., Inc., died on Aug. 7.

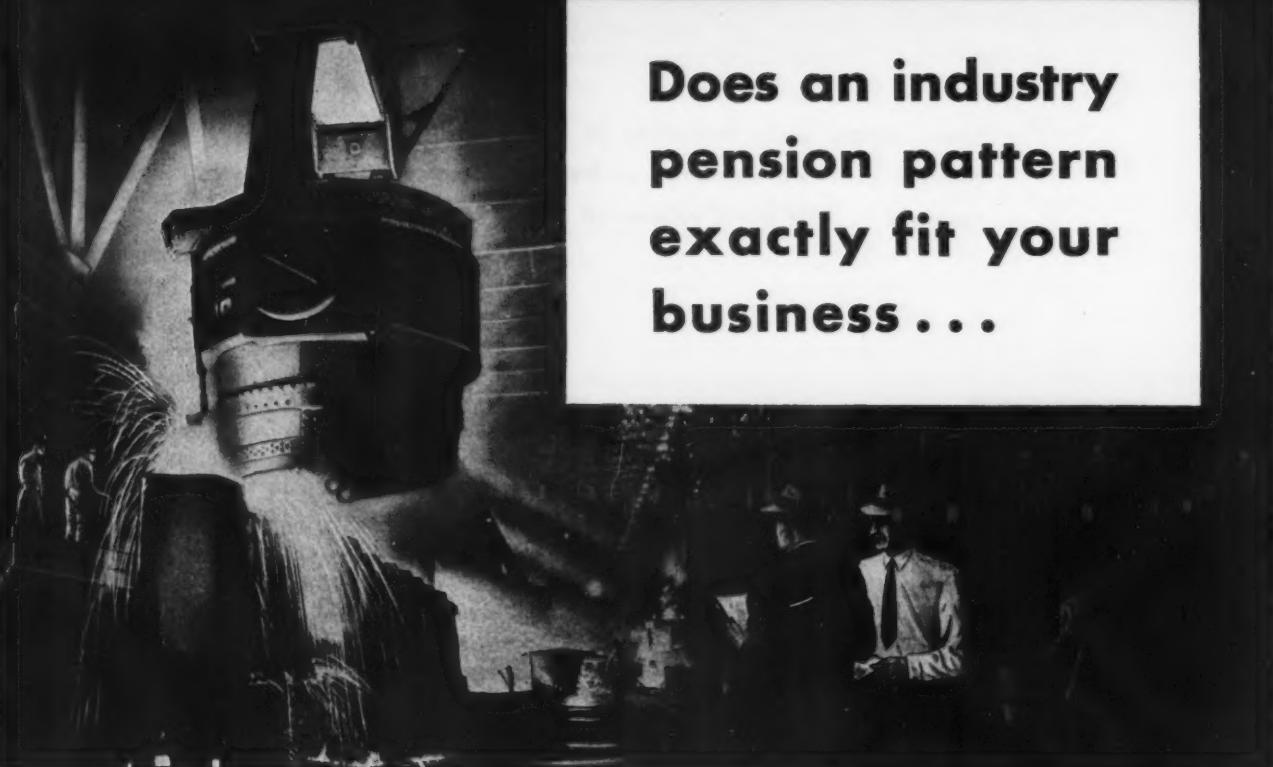
**Charles N. Safford**, president and director of the Lovejoy Tool Co., Springfield, Vt., died recently.

**Irving S. Grombacher**, 47, president of Royal Metal Mfg. Co., Chicago, died recently after a brief illness.

**David C. Gries**, one of the founders of National Screw & Mfg. Co., Cleveland, died Aug. 1. He was 92.

**Earl P. Disbro**, president, W. S. Tyler Co., Cleveland, passed away recently at the age of 66.

# Patterns in Pensions



**Does an industry  
pension pattern  
exactly fit your  
business . . .**

**...or will variations within the pattern mean  
a better pension plan for your company?**

BEFORE you adopt a pension plan based on an industry pattern investigate all variations that can be made within the pattern. You may find that even a slight departure from the industry pattern will enable you to develop a pension plan better fitted to your business and employees.

The accumulated knowledge gained by our Pension Trust Division through years of pension experience is available to you. We shall be glad to

estimate the cost of a pension plan for your company or to discuss with you any pension problem you may have. No obligation whatever.



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# On the ASSEMBLY LINE

## AUTOMOTIVE NEWS AND OPINIONS

**Steel supply seen dwindling in the face of heavy auto demand plus rearmament . . . New engine programs move forward . . . GM parts volume off 25 pct from peak**



By WALTER G. PATTON

**Ahead of Schedule**—The automobile industry's production is running 6 weeks ahead of its 1949 schedules. Before August is completed, it is expected that U. S. plants will have assembled more than 5 million passenger cars and trucks. Almost every car maker is turning out more cars than a year ago. The only exceptions are Chrysler which was closed 3 months by a strike; Packard which is currently down for a model change, and Crosley.

The question as to whether these records can be maintained is largely dependent on steel supply which will in turn be determined by (1) Requests for government projects requiring steel, (2) availability of scarce items like nickel and chromium and (3) distribution of steel

to the industry's vendors. With each passing day more automobile parts suppliers are reported to be making their way to the major auto firms and asking for steel.

**Gray Market Steel**—Evidence of the increased tightness of steel is available on every hand. Last week gray market steel was reported as selling in Detroit at from \$260 to \$280 per ton. Handmill steel was being quoted at \$200 per ton. Perhaps the best evidence of all was the return of the steel Daisy Chain, whose self-styled agents were claiming to have large tonnages arranged for with a major steel mill.

**Speculation on Ford**—Verbal orders for equipment for a new V-8 engine have been reported for Chrysler, Dodge and DeSoto divisions, leading to the speculation that each Chrysler division will eventually build its own powerplant. There have also been some additions to the Chrysler six equipment, according to the trade.

**Placements Coming**—General Motors Transmission Div. is active again and it is anticipated that some placements will be forthcoming there in the near future. Meanwhile, there are strong indications that the first orders for equipment for the new Buick engine plant will be placed within a fortnight. The

engines will be produced in a new building and there is talk that as many as three engines may be included in the final plans.

**Late 1950 Delivery**—Best guess now is that tooling for the new Ford six will be delivered late this year and that the Mercury and Ford V-8 engines will not go into next year. Adding to the active machine tool demand of the big car producers is a strong market for tool room equipment for tool and die shops, including millers, shapers, lathes and similar equipment.

**Crux of Situation**—Probably the best statement describing current auto industry activity on war projects by an automobile firm has come from K. T. Keller, president of Chrysler Corp. In his statement to stockholders, Mr. Keller made it clear that Chrysler is currently engaged in a number of production studies, research projects and other special activities for the armed services.

He said a substantial military truck program is underway and the company expects military requirements will expand.

However, Keller emphasized, the magnitude in timing and the impact of the military demands on the availability of steel and certain other materials used in automotive

production is unpredictable. He conceded that as these materials are taken for the military effort the production of automobiles will be adversely affected.

**Replacement Business**—Supplying service parts for the millions of cars in operation is big business. General Motors, for example, maintains 105 parts warehouses and carries a list of 315,000 separate parts made for General Motors cars and trucks built in the last 10 to 15 years. Last year General Motors' warehouses handled 338,600 tons of merchandise. The all-time high was 451,660 tons distributed in 1948.

Generally speaking, a GM division carries functional parts as long as there is any demand. Chevrolet, for example, still has some 1930 and 1931 dies in storage. Cadillac keeps functional parts in stock for cars back to 1935 and has some parts on its shelves as far back as 1927.

How many service parts does an auto firm make? Chevrolet reports that fender replacements run from 5 pct to 12 pct and that Chevrolet alone is selling 800,000 fenders a year. About 30 pct are for current models, 29 pct for the two preceding models and the remainder for older cars.

**New Bumper Height**—If you see fewer cars on the highway nowadays with their bumpers locked together there's a reason. In 1945 several auto firms asked the SAE to collect data on bumper heights and springing characteristics. This included checking the "diving" tendency of a car when brakes are applied. Over 300 truck models and 44 passenger cars were examined.

After a 6 months' study, SAE recommended that industrywide bumper height of 18.25 in. for all cars and light trucks. Today, practically every auto maker is voluntarily following this practice.

The SAE is also responsible for working on standards on oil, screw threads, bolts, nuts, steel, fan belts, the size of bolt-hole spacing of your battery and many other de-

tails of a modern passenger car. To many outsiders, one of the most remarkable things about the automobile industry is the helpful co-operation between producers who still remain intensely competitive.

**Reuther is Worried**—The UAW-CIO is concerned about steel supply and has written the heads of each of the automotive firms on the subject. Walter P. Reuther, president of the UAW-CIO has asked specifically about "the possible reduction in the amount of steel required by General Motors and the possible reduction in employment."

In a carefully worded reply, C. E. Wilson, president of General Motors, has pointed out that GM is likewise very much concerned with this problem. Wilson recalled that in February, 1942, Reuther was similarly concerned and at that time GM explained what the corporation was doing in defense production and what General Motors' policy plans were for participation in the war effort.

**Wilson Reassures Him**—Wilson pointed out to Reuther that a short time after the GM plans were put into effect "more men and women were employed on war production in General Motors plants than had been employed at any previous time on commercial production."

Reuther had suggested a large industrial group conference to consider ways and means to help solve the problems of mutual interest. In his reply, Wilson said he did not feel that a large group conference would be of much help to the government in this emergency but added he would be pleased to discuss the GM situation with such members of the UAW-CIO as Reuther cared to bring along to a meeting with him.

**Permanent Lockout**—The struck Auburn clutch plant, a division of Dana Corp., has resumed operations after a 7-week strike. The company had threatened to close the plant permanently unless the strike was settled.

### THE BULL OF THE WOODS

By J. R. Williams



where the going is

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# WEST COAST PROGRESS REPORT

Digest of Far West Industrial Activity—By R. T. REINHARDT



**Canadian Ore to Japan**—After having been closed for more than 20 years the Prescott Iron Ore Mine on Texada Island, 50 miles north of Vancouver, B. C., will be reopened within a few days. A contract for opening of the mine and shipment of ore to steel mills in Japan has been negotiated with the A & C Development Co., a Vancouver firm in a deal involving approximately \$1 million.

**Boeing Airplane Expands**—An investment of approximately \$3 million by the Boeing Airplane Co., has been authorized by the board of directors to increase research and manufacturing facilities at Seattle.

Largest single expenditure under this program will be \$1,500,000 for expansion of the company-owned wind tunnel and the balance of the money will be used for new machines and tools and additional office facilities. Improvements in the aerodynamic laboratory will open up a new field of testing at highly critical transonic and supersonic speeds.

**Pressed Metals Prospect**—With aircraft contracts increasing rapidly, officials of Douglas Aircraft Co. at Los Angeles are debating the future of its Western Pressed Metals Div. Actually this division uses only a small part of the overall facilities of the company, but its activities have increased more than 100 pct during the past year and it

now uses approximately 300 tons of steel and aluminum per month.

The division was formed by Harry Woodhead to use aircraft workers and equipment, if they were not engaged in plane production, to develop aircraft techniques when working with steel. It now has among other contracts one with a major automobile manufacturing plant producing gravel guards, baffles and other parts for the assembly line.

**Voluntary Allocation**—Under what might be termed an unofficial voluntary allocation program, western warehouses are finding that their stocks of steel are disappearing more rapidly than replacements become available.

Shortages have developed in most items, even those which a week or two ago were in over supply. Demand continues heavy for all items although apparently some specialty lines such as tool steel are available in quantity.

Small operators in particular are complaining more loudly than ever that both western and eastern steel producers are too stringent in their allocations and that deliveries are almost unpredictable. However, many operators reflect the attitude of one who said, "we can't expect to get steel we hadn't ordered in advance just because the demand has suddenly increased."

**Fuming Fabricators**—Steel fabricators who several months ago

were out scouring the hinterlands for business and figuring all bids with a very sharp pencil are today finding plenty of new work available but with a shortage of plates and eastern made shapes cramping their style.

Many bids are being made on an "if and when" basis with completion dates set at so many days after delivery of steel. Occasionally jobs are being accepted on bids based on warehouse prices and others include a clause in their bid making prices subject to published national increases in steel prices.

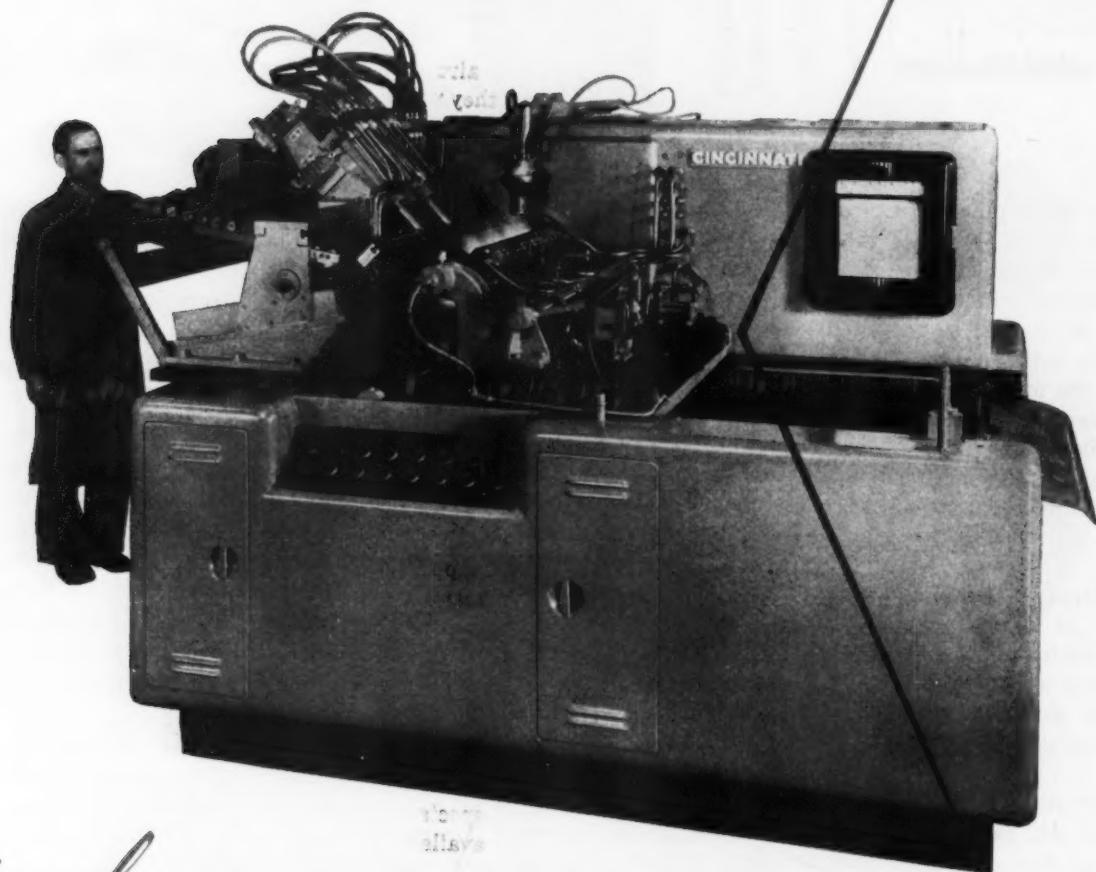
**First Cobalt Refinery**—Utah Construction Co. has started work on a \$1,200,000 cobalt refinery, only one in the United States, for the Howe Sound Co. of New York, at Garfield, Utah. It is designed to process 600 tons of cobalt concentrates daily and annual production will be about 2 million lbs.

**Copper Refinery Starts**—Kennebunk Copper Corp. has turned on the power at its \$16 million electrolytic copper refinery at Garfield. Several hundred men will be employed. Kennecott has announced that when the refinery gets into full production it will abandon the traditional Connecticut River Valley pricing base and put into effect a new nation-wide pricing system. The change will give western consumers a more competitive price.

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Above: Cincinnati Flamatic Hardening Machine in automobile manufacturer's plant. Right: Close-up of camshaft being processed.

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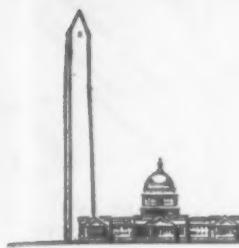
This job proves again that Flamatic hardening gives you virtually 100% predictable results, reduces distortion and human variables, puts surface hardening on a production basis. Results: duplicated to specs... every section a "carbon copy" of the etched section shown above. Distortion negligible, subsequent straightening reduced. Flamatic holds to rigid specifications through electronic control of temperature (within plus or minus 20°F), handles gears, cams, etc., up to 18" OD, shafts, etc., up to 36" long. Write for booklet "FH" of case histories, or better still, send us a part print for analysis and recommendations.

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## THE FEDERAL VIEW

### THIS WEEK IN WASHINGTON

**Controls Taking Shape**—Sanity is replacing the original hysteria which seemed to pervade the control outlook. More definitive plans are taking form at the Commerce Dept. and they don't add up to any great upheaval for industry. With the added military spending due to be spread over 12 to 15 months, the immediate controls are not expected to be broad or onerous. The Commerce Dept. expects to set up a new office, probably called the Defense Production Administration. It will likely be split into a Bureau of Industry Operations and a Program Bureau.

**Inventories and Allocations**—Inventory limitations on selected critical materials are slated for an early effective date, but only at the manufacturing level.

Voluntary allocations of steel and other key commodities will be tried first with industry committees having a major role. Selected priorities will also be invoked. Priorities and allocations will be for military and military supporting activities only. It is believed, however, that strict mandatory allocations may be needed immediately for a few critical commodities in cases where the supply and the sources of supply are limited. Examples might be nickel, tungsten, tin, columbite and others. In such cases, the Commerce Dept. would tightly control the supply and usage of these materials.

**No Limits On Output**—Production limitation orders are not part of present planning. While military orders will cut into production of civilian goods slightly, current thinking is to let the chips fall where they may. Voluntary limitations would be tried before any formal system of "L" orders is invoked.

Conservation orders for a few selected materials, such as tin,

By EUGENE J. HARDY



nickel and platinum are a good bet. While this might affect the amount of bright work and gadgets on many civilian products, it would not affect their overall availability.

**New Essential Lists**—The lists of essential industries and critical occupations issued in connection with the Defense Dept.'s reservist deferment policy (THE IRON AGE, Aug. 10 p. 91) are now undergoing substantial revision. The original list of industries was so broad that it amounted to little more than a recognition that most industries do have a place in a wartime economy. It meant little as far as obtaining an actual deferment. The occupational listings were more reliable. The new lists will set rigid standards which will apply to draftees as well as reservists.

**Copper Suspension Coming**—Despite the delaying tactics of mining-state congressmen, you can expect Congress to suspend import duties on copper, as well as on ferrous and nonferrous scrap, before long.

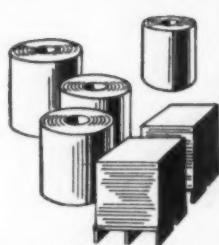
Here's the story: Western senators, plagued by constituents anxious to restrict foreign imports of copper, succeeded in getting legislation suspending the import tax tabled. But at the same time they entered into this deal to "get off the hook" with their home-state interests. They secretly

agreed to permit the tax-suspension bill to come up as a "rider" to pending legislation suspending the scrap levies.

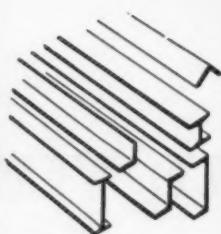
**Prices Free**—Neither selective nor general price and wage controls appear to be in the offing. Should they be made effective this year, the justification would be more in the realm of politics than economics. Full-scale war or mobilization would also change this picture overnight. The Labor Dept. will handle manpower problems, most important of which involve recruiting for defense industries and apprentice and other training.

**FTC Studies Steel**—Two economic studies vitally affecting the steel industry are underway at the Federal Trade Commission. One involves the alleged problems of monopoly in the supply of iron ore. Of greater scope, is the one on the price structure of the steel industry which will probably be completed some time during the next 12 months.

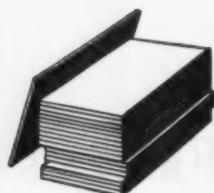
The price study is based on evidence developed in the Commission's case involving the pricing system of the industry. FTC claims that its economists now have more complete information about steel's price structure than is elsewhere available. Two-thirds of the work necessary to the development of the report has been completed.



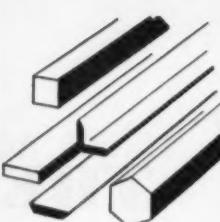
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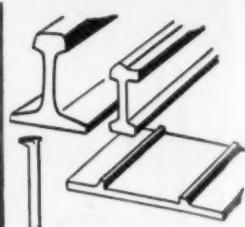
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CARBON STEEL PLATES



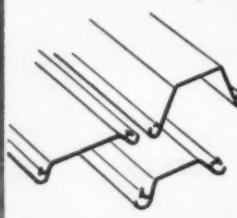
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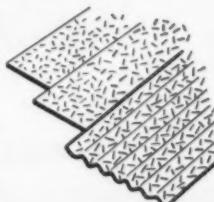
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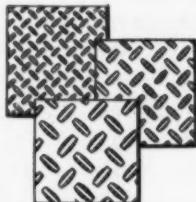
HI-BOND<sup>®</sup> REINFORCING BARS



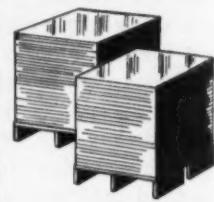
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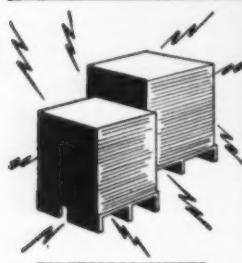
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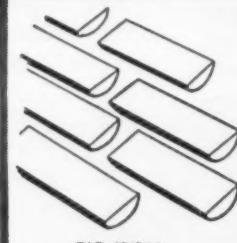


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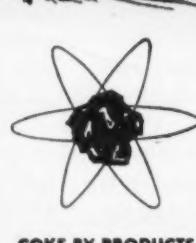
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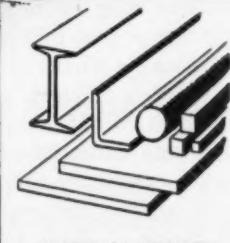
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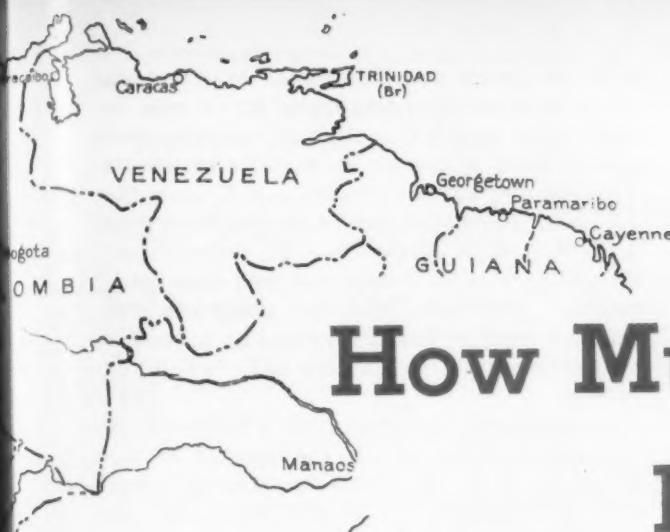
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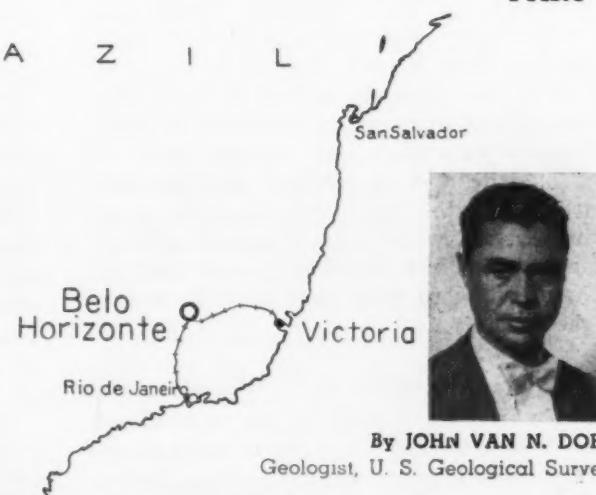


IRON AGE  
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FEATURE ARTICLES

# How Much Iron Ore In BRAZIL?



## PART I



By JOHN VAN N. DORR  
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CONSIDERATION of the quantity, quality, and types of ore present in Brazil is fundamental to any reasonable approach by Brazilians to the development of their resources. It is equally necessary for long-term planning by potential consumers in the United States. Therefore, the Brazilian Departamento Nacional da Produção Mineral and the U. S. Geological Survey undertook a joint long-term study of the problem. In this work the Survey is financed by the Dept. of State through the Interdepartmental Committee on Scientific and Cultural Cooperation. The study is confined to a roughly quadrangular area, comprising about 4000 square miles (Fig. 1) in which there are now railroads and fair highways. This is by no means the

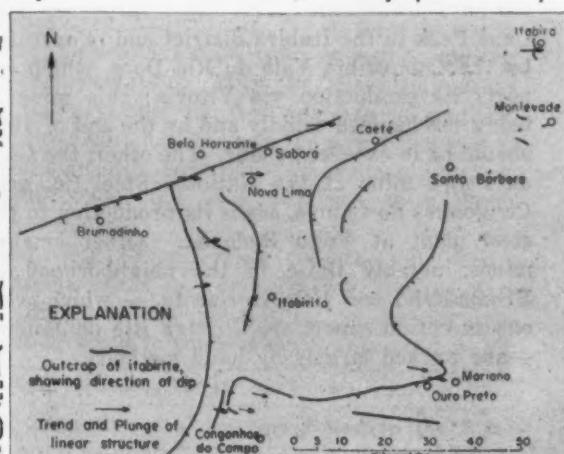


FIG. 1.—Region studied by Geological Survey. Work on this field started recently and may take years to complete. The trend lines in the insert above indicate the principal itabirite outcrops.

That Central Minas Gerais, Brazil, is rich in iron ores has been known for many years. The true extent of these ores and their possible economic significance to Brazil and the rest of the world are still unknown and undoubtedly will remain so for many years to come. Changing economic patterns in the steel industry, the rapid industrialization of Brazil, and, perhaps most important, experimentation and possible development of new technology in steelmaking may radically change things during the next two decades.

only iron-bearing area in Minas Gerais, for a zone at least 200 miles long stretches to the north-northeast of the area shown in Fig. 1, but it is the area with greatest economic possibilities. This work is now only well started; some years will elapse before even approximate quantitative data will be available. However, in view of present American interest in iron ore sources, it seems worth while to summarize present knowledge and, perhaps more important, present ignorance.

The first work that brought to world attention the latent iron-ore resources of Brazil was Derby's contribution to the International Geologic Congress in Sweden in 1910. This meeting attempted a summary of world iron-ore resources, and it was found that Brazil was among the leaders in claimed ore reserves. About this time British, American, French, and German capital began to acquire interests in Brazilian deposits and, until World War I, great activity took place. Ore deposits were examined in many parts of Brazil, but the area of greatest promise was found in the south central portion of the state of Minas Gerais, where long ridges of itabirite (metamorphosed iron formation) were punctuated here and there with large deposits of ore of highest quality.

#### Reliable Appraisals Are Difficult

Actually, reliable appraisals are difficult to make. Because the hard iron ore is resistant to tropical weathering, it crops out boldly. Consequently, many early observers may have overestimated the percentage of hard high-grade ore and underestimated the quantity of the softer ores, which rarely crop out. The subsurface has been inadequately explored because the impressive outcrops seem to make detailed exploration unnecessary. Also, drilling in the hard iron ore with present techniques is slow and expensive and yields insufficient information. Only two of the many iron deposits in Brazil have been adequately explored.

The Andrade deposit of the Companhia Belgo-Minera was explored by tunnels, and the Fabrica

de Ferro deposit near Congonhas do Campo was also prospected quite thoroughly by tunnels. Between 1910 and 1940, a British company drove several miles of tunnels on deposits in the Itabira district, but the records are so poor that not much information can be gleaned from them. A small portion of the Casa da Pedra deposit near Congonhas do Campo has been explored by tunnels. Elsewhere, with few exceptions, estimates of reserves have been based on subsurface projection of surface features and are quite unreliable.

In considering Brazilian ores, a sharp distinction must be made between the types of ore used by much of the Brazilian industry and those that are exported. Before the large coke-burning National Steel plant at Volta Redonda was completed, all the domestic blast furnaces depended on charcoal for fuel. Although excellent iron and steel can be made in charcoal blast furnaces only the more easily reducible ore can be economically used. Despite the fact that the charcoal supply is the greatest problem of the industry, new charcoal plants are still being built. With one exception, they can treat only hydrated ores, called "canga" or "chapinha," which results from surficial weathering of itabirite or other ferruginous rocks. Recently the Companhia Belgo-Minera installed a sintering unit which permits the use of soft high-grade ores, and blast-furnace efficiency has been greatly benefited with notable fuel economy. Sintering or agglomerating units will undoubtedly be installed in the future at other plants.

Iron ore exports in 1949 were confined to hard high-grade lump ore. Many mines, most of them small, produce such ore, but two mines dominate the hard-ore picture. The largest producer is at Caué Peak in the Itabira district and is operated by the Companhia Vale do Rio Doce, which exports its production via Vitoria; this mine is being mechanized rapidly and by the end of 1950 should be in excellent shape. The other, the Casa da Pedra mine of the National Steel Co. near Congonhas do Campo, sends its production to the steel plant at Volta Redonda. Other smaller mines, notably those in the neighborhood of Brumadinho and Belo Horizonte — which with one exception export ore through Rio de Janeiro — are worked largely by hand methods.

## HIGH-GRADE ORES

THE Brazilian deposits are best known for the fine high-grade lump ore that they yield. The main ore mineral is blue specularite (a variety of hematite); magnetite is sparingly and erratically present; and martite occurs to a limited extent. The only visible impurity in the high-grade ores is a platy brown, tan, green, or white material which chemical and microscopic studies suggest to be talc. The distribution of this

mineral is variable and only locally is it present in high enough proportion to lower the grade materially.

The theoretical composition of pure hematite,  $Fe_2O_3$ , is 70 pct iron and 30 pct oxygen. The purity of the lump ores is attested by the grade shipped from Caué Peak during 1948. Table 1 gives a summary of buyers' analyses of more than 380,000 tons, and shows an average grade

TABLE I BUYERS' ANALYSES				
Ore Exported from Caué Peak, Itabira District, Brazil, 1948*				
Tons Represented in Average	Elements and Compounds	Average Percent	Maximum (Shipload Lot) Percent	Minimum (Shipload Lot) Percent
384,867	Fe (Dry)	68.7	69.90	67.66
292,105	P	0.036	0.059	0.026
137,175	SiO <sub>2</sub>	0.52	0.70	0.37
146,339	Al <sub>2</sub> O <sub>3</sub>	0.83	1.00	0.10
56,040	MgO	0.12	0.42	0.03
37,543	CaO	0.05	0.05	0.03
109,006	Mn	0.08	0.14	0.03
353,220	H <sub>2</sub> O	0.78	1.84	0.18
9,558	S	0.019	...	...
224,329	H <sub>2</sub> O (Dry Season)	0.59	...	...
128,891	H <sub>2</sub> O (Wet Season)	1.14	...	...

\* Total Ore Exported—384,867 Tons.

of 68.7 pct Fe (dry basis). One shipload reached the nearly incredible grade of 69.90 pct Fe (dry). Few buyers analyzed for more than Fe, H<sub>2</sub>O, and P, and only two-thirds of the shipments were analyzed for P.

The phosphorus content went as high as 0.059 pct in one shipment as compared with an average of 0.036 pct. This was because surface material high in that element was inadvertently included in the shipment. The cause of the difficulty was quickly established, and the phosphorus content of the lump ore should average appreciably less in the future. Only by very wasteful, rigorously selective mining can the phosphorus content of Caué ores, at least, be reduced to 0.02 or less.

#### Moisture Content Low

Table I shows that the moisture content of the ores as received by consumers is very low, averaging 0.78 pct for the year and 0.59 pct for the dry season. Such a low moisture content must indicate very low porosity, for during the rainy season the ores are thoroughly soaked in mining and transportation. Both the moisture content and the dry analysis for iron are in contrast with the Labrador ores and the newly discovered Venezuelan ores, both of which contain water of crystallization and free moisture to a much greater degree.

According to an article recently published,\* Venezuelan ores in Cerro Bolivar average 63.8 pct (dry) and 59.0 pct natural. Labrador ores are understood to contain much entrained water

\* *Mining Engineering*, Vol. 187, No. 2, February 1950, p. 191.

also; their dry analysis was stated in the same article to average 59.3 pct Fe, whereas the natural analysis was given as 53.4 pct. Phosphorus was stated by the same source to average 0.113 pct in Cerro Bolivar and 0.071 pct in Labrador.

Table II gives less complete data on ores received by the National Steel Co. at Volta Redonda during parts of 1946. These ores were mined from the Fecho do Funil area, near Brumadinho (Fig. 1), where both talus ore and ore in place are mined; from Pico do Itabira, near Itabirito (not to be confused with Itabira) which is en-

tirely talus ore; and from the Casa da Pedra mine near Congonhas do Campo, where only ore in place is mined. It will be noted that phosphorus is somewhat higher than in the Itabira district and iron is a little lower. Mining practice influences both these factors. No data on moisture are at hand from the western area but it should be similar to that in Caué ores.

#### Physicals Vary Considerably

Structural strength and other physical characteristics of the lump ore vary considerably within each deposit and from deposit to deposit. Lump ore from the western side of the district, where metamorphism has been somewhat weaker, tends to be finer grained and closer knit than that from the eastern side. Pneumatic drills generally have considerable difficulty making hole and bit wear is excessive in such deposits as Pico do Itabira, on the west side. On Caué, however, drilling averages about a foot a minute. Tests of compression strength of the Caué lump ore showed an average strength of 48,300 psi and maximum strength of 62,300 psi. No similar data on other ores are available to the writer. Because of the purity and density of the ores, broken ore averages about 2 long tons per cu yd. Ore in place is usually calculated as 5 metric tons per cu m or 3.78 long tons per cu yd.

#### Steel Control Simplified

This high-quality lump ore is obviously a premium ore for openhearth use. At the Volta Redonda plant, the high purity of the ore makes control of the composition of the steel easy; and percentages higher than normal in United States practice have been used in the furnace charges with improved quality and rate of production. Large lumps are said to break up into pieces the size of a man's fist. As a blast-furnace ore, this material has been said to be somewhat abrasive and refractory, although quite usable. It, of course, makes a very heavy burden.

At Volta Redonda, practice has been to use up to 70 pct hard ores in the blast furnaces, crushed to minus 2 in., with 30 pct siliceous itabirite and canga. By reducing the percentage of hard ore

TABLE II

#### VOLTA REDONDA RECEIPTS

Average Composition, in Percent, of Monthly Shipments of Lump Ore Received at National Steel Mills, Volta Redonda, During Part of 1946.

From	Fe (Dry)	P	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>
Fecho do Funil area (several mines)...	68.00	0.077*	1.06	0.28
Casa da Pedra mine .....	68.46	0.056	0.49	1.01
Pico do Itabira .....	69.27	0.060	0.66	0.07

\* Two monthly analyses of phosphorus, one showing traces, other 0.008 pct, were omitted from average as writer does not believe them trustworthy. If these are included, average is 0.049 pct P. (Data courtesy of Russell Fleming. Actual tonnage is unknown but is more than 10,000 tons in each case.)

and increasing that of canga and itabirite, which are more easily reducible, it is believed that more efficient operation may be obtained through lower coke consumption and lower furnace temperatures.

#### Soft Ore Outlook May Change

**A**LTHOUGH the high-quality lump ore is the only type now being exported from Brazil, it is by no means the only type of ore available. In fact, a continuous transition exists between very hard lump ore and incoherent soft ore, and greater or less quantities of all types occur in almost all deposits. The soft ore is little known because it rarely crops out and has been of slight economic interest. The development of sintering and agglomerating techniques and the dwindling of supplies of high-grade blast furnace ore in the United States may change the economic position of this material. Because of the low percentage of impurities it would make an excellent blending ore.

*Brazilian soft ore contains two types of material that are nearly the same from an economic viewpoint but probably different from a geologic viewpoint. One is soft ore intimately associated with hard ore. This generally occurs in small bodies and is often black or steel gray. Fragments of hard ore are commonly found in this soft ore. The other type of soft ore is much more homogeneous and is blue rather than black. It occurs in larger bodies, often on the periphery of hard-ore bodies. Herein this material is referred to as powder ore; in some districts in Brazil it is called jacutinga, a term so loosely used that it no longer has a specific meaning. Powder ore is generally higher grade and finer grained than soft ore and might be valuable in powder metallurgy.*

The soft ore, which was probably derived by surficial weathering from the lump ore, occurs in irregular masses in and around the lump ore. It is either blue, like the hard ore, gray, or black, contains the same gangue material, talc, and is usually quite pure. The blue ore is composed of specularite plates; the black ore has not yet been studied, but it is probably also largely specularite.

Most of the soft ore is chemically indistinguishable from the lump ore, but some of it is a percent or two lower in iron. Not enough data are available to generalize safely about either the chemical or the physical constitution of this material. Many screen analyses show a very high percentage of minus 100-mesh material; others show a greater percentage in the 35- to 70-mesh range. The blue ore is perhaps somewhat finer than the black ore.

Little is known of the quantity of soft ore in the Minas Gerais iron region, for the little prospecting accomplished has been directed toward the lump ore. Soft ore does not crop out, and surface manifestations give little clue to the presence of this material. It is known that many millions of tons exist in the Itabira district and that considerable but unknown amounts occur

near Belo Horizonte, at Casa da Pedra, near Cattas Atlas, and at many other localities. As mining progresses, it is probable that more of this material will be discovered.

#### Intermediate Ore Reserves Are Immense

There are large volumes of rock that lie between the end points of the transition lump ore-soft ore. Classification of such mixed material must always be arbitrary and unsatisfactory, particularly when one end of the series is now salable (and therefore, according to strict usage, ore) and the other end is not.

Most of this intermediate material will give, on screening, hard lump ore as well as varying percentages both of material that could be charged directly in the blast furnace (between  $\frac{1}{2}$  in. and 10 mesh) and material that must be sintered or agglomerated. Methods of study available to the present work preclude any truly quantitative approach to this problem, and only visual estimates, checked as well as possible by occasional sampling, can be attempted. Chemically the material is in large part similar to the lump ore from which it was derived. There can be little question but that the amount of this material available in the region will be measured in hundreds of millions of tons, but it would be sheer guesswork at this point to estimate the relative percentages of ore suitable for open-hearth, blast furnaces, or agglomeration that will eventually be obtained from this type of material.

On Caué Peak, between 20 and 40 pct of the material mined is rejected as undersize (less than  $\frac{1}{2}$  in.). Fig. 2, in Part II of this article, shows a screen analysis of a 300-lb grab sample of rejected fines, as well as chemical analyses of the screen fractions. Because this material is contaminated by small lenses and beds of soft siliceous iron formation, the average iron analysis is lower than could be supplied were the fines now salable. It is apparent that a high-quality concentrate of the fine material could be made simply by saving the plus 10-mesh material.

No data are available on the percentage of finer material produced at the Casa da Pedra mine. As the ore is used for both openhearth and blast furnace, specifications are not so rigid as at Caué. Visual inspection suggest that the percentage of minus  $\frac{1}{2}$ -in. ore produced is approximately equal to that from Caué. At Brumadinho the bedrock mines probably produce higher proportions of lump ore. For Pico do Itabira, near Itabirito, no estimate of percentage of fines is possible as operations are now confined to picking up the talus of hard iron ore around the peak proper. As mining proceeds in any hard ore body, the production of fines will vary considerably from place to place.

THE SECOND PART OF THIS TWO PART ARTICLE WILL APPEAR IN NEXT WEEK'S ISSUE.

# STOP ACCELERATED OXIDATION AND GET BETTER JET ENGINES

Formation of unprotective oxides on high temperature steels causes continuous oxidation: Low metallic oxides contaminate the original oxide phase. These offenders are oxides of vanadium, bismuth, molybdenum, tungsten and lead. This accelerated oxidation has been stopped on a laboratory scale by minimizing contamination and adjusting alloy composition.



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RECENT developments of new alloys having superior mechanical properties for high temperature use, have led to the recognition of a form of "accelerated oxidation." This had previously been encountered only in the oxidation of pure tungsten,<sup>1</sup> and more recently of molybdenum<sup>2</sup> and the molybdenum-bearing stainless alloy, 16 Cr-25 Ni-6 Mo.<sup>3</sup> Accelerated oxidation is referred to as catastrophic oxidation, rapid oxidation, and crudding.

The essential difference between accelerated oxidation and the oxidation usually encountered among conventional metals and alloys, is that the corrosion product formed in the former case does not act as a barrier to continued attack. The scale layer is either entirely unprotective, leading to a linear rate of oxidation, or it actually causes more intense attack to occur as the scale layer thickens, resulting in a continually accelerating rate of oxidation. The latter is more common.

This type of corrosion is presently being investigated at the Massachusetts Institute of Technology in an attempt to understand the basic principles involved with the hope of suppressing the rapid rate of attack among certain alloys subject to accelerated oxidation.

The alloys known to be susceptible to accelerated oxidation in ordinary air have in com-

mon the presence of one or more of the following elements as an alloying constituent: vanadium, molybdenum, or tungsten. These elements promote accelerated oxidation in Fe-Ni-Cr alloys, the severity of which decreases when alloyed with the above elements in the order named. These elements are unique in that their highest oxides have very low melting points and/or high vapor pressures.

The order of the elements named, however, parallels the increase in melting points of their oxides, rather than their vapor pressures. The vapor pressure of  $\text{MoO}_3$  is the highest of the oxides named and is given by the formula of K. K. Kelley<sup>4</sup>

$$\log P = \frac{15,110}{T} + 1.46 \log T - 1.32 \times 10^{-3} T + 9.071,$$

where P is in atmosphere pressure  
and T is temperature in degrees Kelvin.

The vapor pressure of  $\text{MoO}_3$  at 1832°F is 0.25 atmospheres, and reaches a value of 1 atmosphere at 2104°F.

Below approximately 1300°F, alloys containing V, Mo, or W are oxidized normally. These alloys are subject to the accelerated type of at-

tack only above certain critical temperatures which depends upon several factors. The critical temperature is highest for tungsten, intermediate for molybdenum, and lowest for vanadium. The actual value varies with the amount of alloy present.

#### Effect of Alloying Constituents

Leslie and Fontana<sup>2</sup> have recently investigated the oxidation behavior of the heat resistant alloy, 16 Cr—25 Ni—6 Mo. They proposed a theory to explain the rapid oxidation which was based on the dissociation of  $\text{MoO}_3$  according to the equation:  $\text{MoO}_3 \rightarrow \text{MoO}_2 + \text{O}$ . The rapid oxidation was attributed to the oxygen thus released. Meijering and Rathenau<sup>3</sup> disagree with this explanation, as do the present authors, and attribute the action to the presence of a liquid oxide phase.

The early work done in the writers' laboratory by Kling<sup>4</sup> showed that the alloys listed in Table I, some of which contain as little as 2 pct Mo, were susceptible to accelerated oxidation.

Later work by Cremens<sup>5</sup> on modifications of the 16 Cr—25 Ni—6 Mo alloy showed that variations in composition may increase or decrease the intensity of accelerated oxidation. An increase in the chromium content from 16 pct to 20 and 25 pct improved the corrosion resistance perceptibly. A similar improvement was observed when the nickel content was increased from 25 to 30 pct. An increase in carbon content from 0.1 to 0.4 pct was also reported to have resulted in improved resistance to accelerated oxidation.

Since molybdenum is the undesirable constituent from the viewpoint of oxidation resistance, a reduction of this element in the alloy is one obvious cure. Accordingly, specimens containing 4 and 2 pct Mo were prepared, and as expected, were found to be less prone to accelerated oxidation, but did eventually fail by accelerated oxidation at longer times or higher temperatures. Another successful technique involved the substitution of increasing amounts of tungsten for similar amounts of molybdenum in the alloy.

Conversely, an increase in the molybdenum content of the 16 Cr—25 Ni—6 Mo alloy would be expected to result in increased corrosion. This was indeed found to be so at 10 pct Mo. Cremens<sup>5</sup> also reported that the substitution of vanadium for molybdenum increased the rate of attack. Furthermore, the addition of 26 pct Ti or 1 pct Al was reported as being undesirable from the corrosion viewpoint, whereas the effects of 2 pct Ta or 2 pct Zr additions were uncertain. The increase of silicon content to 1

pct was reported to result in increased corrosion. The writers prepared a 16 Cr—25 Ni—6 Mo alloy with 3 pct Si, and found it to be definitely superior to a 0.2 pct Si alloy. However, the sigma forming tendencies of increased amounts silicon may discourage its use.

Gleason<sup>6</sup> experimented with an alloy of 16 Cr—25 Ni—6 Mn at temperatures of 2000°F and 2100°F. This alloy showed resistance to accelerated oxidation in air, but in an air atmosphere contaminated with  $\text{MoO}_3$  (from adjacent specimens containing molybdenum) the alloy oxidized in the accelerated manner.

Richardson<sup>7</sup> studied the corrosion behavior of type 316 (18 Cr—12 Ni—2.5 Mo) and type 310 (25 Cr—20 Ni) stainless steels having varying amounts of molybdenum. He reported an initial period of protective oxidation after which there was a change to the accelerated rate, which was maintained until the metal was consumed, or until the test was terminated. Type 316 stainless steel formed a protective oxide only below 1800°F, whereas type 310 steel modified with 3 pct and 6 pct Mo withstood 2000°F without any evidence of accelerated oxidation during the 60 hr test period.

The test results have indicated that the oxidation of the 16 Cr—25 Ni—6 Mo alloy is very erratic and that reproducibility is very poor. Individual specimens are frequently observed with a fraction of the surface lightly attacked whereas other portions suffer very severe corrosion. The progression of accelerated oxidation, once initiated, is regular but the time required for nucleation and the size of area affected cannot be predicted.



FIG. 1—Symmetrically uniform and asymmetrical growth of accelerated oxide on 16 Cr—25 Ni—6 Mo alloy in air at 1900°F.

Fig 1 illustrates symmetrical and asymmetrical progression of accelerated oxidation. Clearly, there must be local variation in some essential conditions which transform the decelerating protective oxidation to the accelerating non-protective oxidation. The nature of this transformation was found to be quite puzzling.

#### Effect of External Contamination

It has been found by experience that alloys which do not contain any of these harmful elements may be attacked abnormally if substances containing these and other harmful elements contact the oxide surface<sup>10, 21, 22, 23</sup>. For instance, ship

boiler supports of 25 Cr—20 Ni alloy heated by the products of combustion of vanadium-bearing fuel oils, as found in Venezuela and certain parts of Mexico, Iran and Oklahoma, were found to have been subjected to abnormally severe corrosion. A structural member of a superheater is shown in Fig 2. Note that the 5/16 in thick sec-

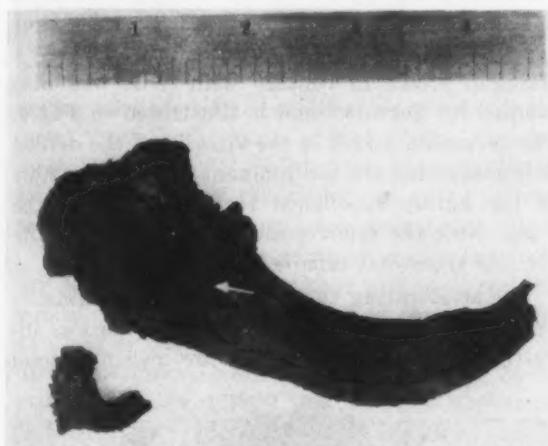


FIG. 2—Ship boiler support, 25 Cr—20 Ni alloy, corroded by products of combustion of vanadium-bearing fuel oil. Note similarity in appearance of oxide on support (arrow) and completely corroded 16 Cr—25 Ni—6 V laboratory specimen.

tion is reduced to zero thickness at the point of failure by accelerated oxidation. The oxide bulk was found to have the same spinel-type structure as the oxide of 16 Cr—25 Ni—6 V.

Some performance tests made on several grades of stainless steel as blade material for gas turbines powered by vanadium-containing fuel oil have been reported by Bucher.<sup>10</sup> Heavy corrosion

TABLE I

SUSCEPTIBLE ALLOYS

Some High Temperature Alloys Susceptible to Accelerated Oxidation in Air at Elevated Temperatures

Alloy	Percent, Major Element					Percent Others
	Cr	Ni	Mo	W	Cb	
S 588.....	18	20	4	4	4	Bal Fe
S 590.....	20	20	4	4	4	20 Co
N 155.....	20	20	3	2	1	Bal Fe
16-25-6.....	16	25	6	.....	.....	20 Co
18-8M.....	18	12	2.5	.....	.....	Bal Fe
19-9 DL.....	19	9	1.2	1.2	0.3	0.2 Ti
						Bal Fe

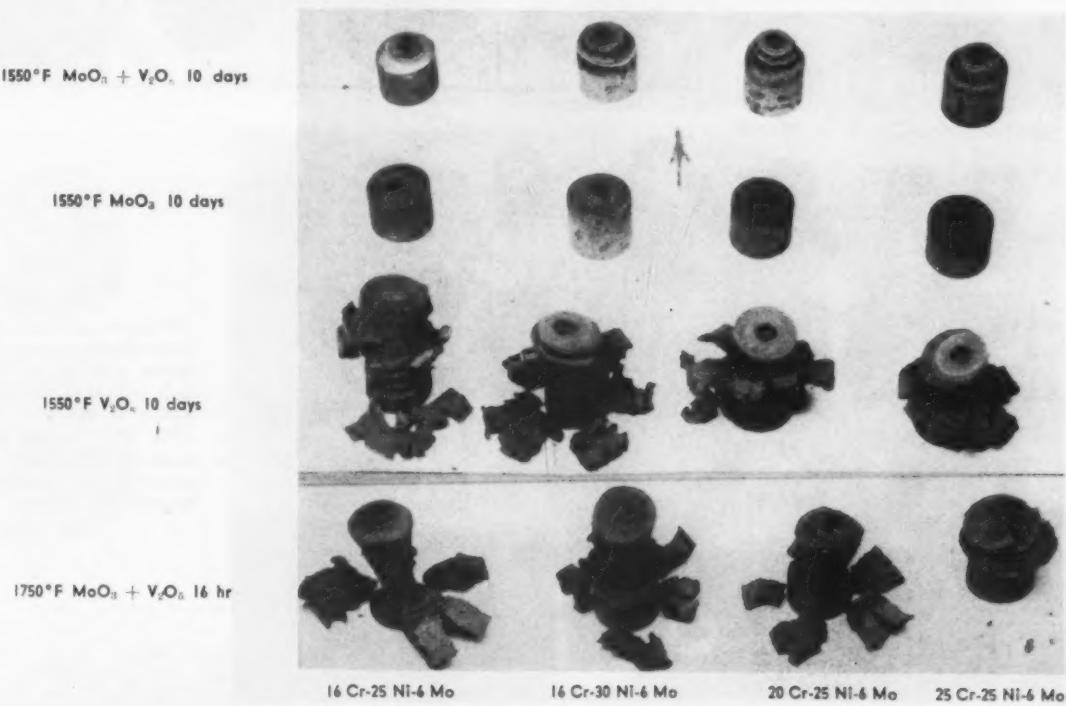
was reported which was not encountered when vanadium-free fuel oils were used. High nickel alloys, Nimonic 80, were reported to have successfully resisted the accelerated attack caused by contact with the vanadium-rich fuel oil ash.

An investigation was made by Amgwerd<sup>11</sup> on the attack of U. S. and foreign grades of commercial heat resisting steels by oil ash residues of the compositions shown in Table II. A portion of this work was published elsewhere.<sup>12</sup> The increase in attack due to contact with oil ash was shown to be much more severe than contact with  $V_2O_5$  alone. Furthermore, the rate of corrosive attack is shown to rise sharply with temperature.

Wulff<sup>13</sup> has investigated the effect of vanadium-bearing oil on the corrosion properties of heat resisting steels. This work will be published shortly. In the early work on the oxidation phenomenon by Pfeil,<sup>14</sup> brief mention was made of a change in oxidation behavior of iron after being coated with a slurry of  $PbO$ , which melts at  $1630^{\circ}\text{F}$ .

Gervais<sup>15</sup> studied the accelerated oxidation of

FIG. 3—Contaminated test specimens after exposure to air under conditions shown.



## Stop Accelerated Oxidation

Continued

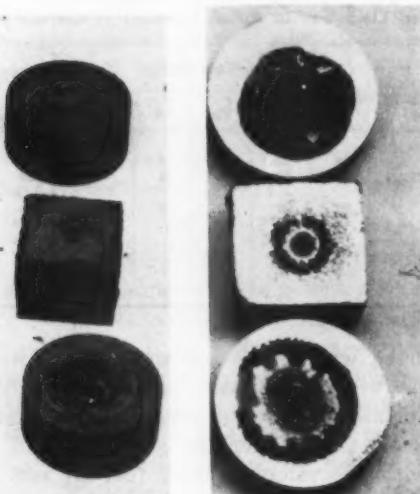


FIG. 4—Top to bottom, Types 347, 314 and 304 after contamination with  $V_2O_5$  and 10-day exposure to air at 1550°F. Left, after oxidation; right, after light polishing.

FIG. 5—Appearance of type 347 stainless steel specimens after contamination with substances shown for 24-hr exposure to air atmosphere at 1900°F.

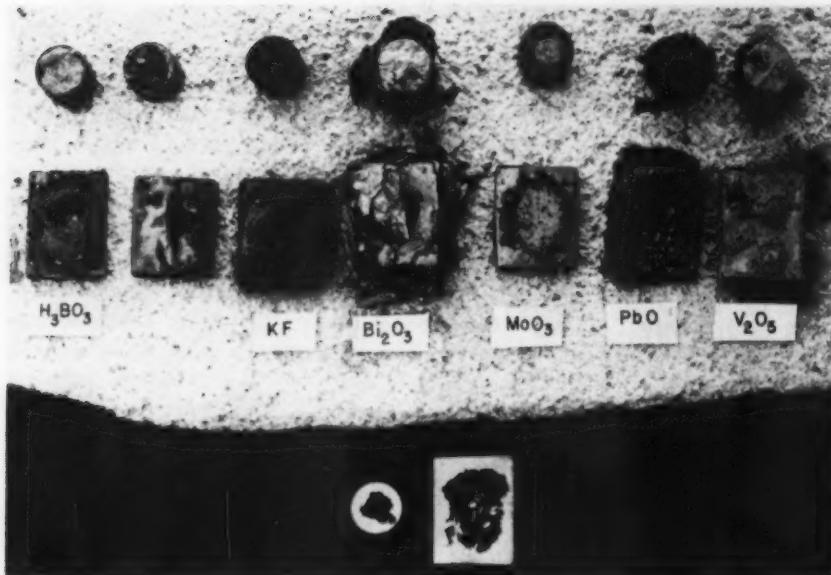
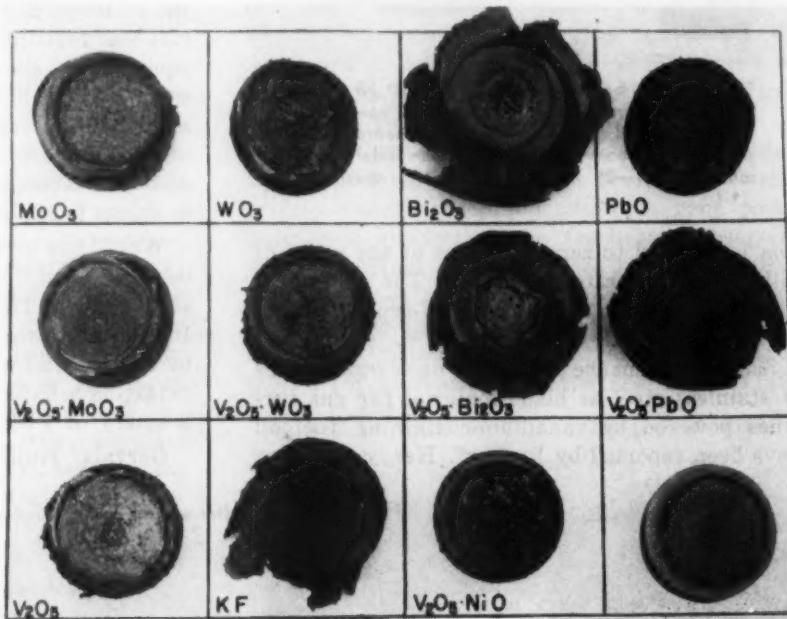


FIG. 6—Appearance of Armco iron specimens after contamination with  $\frac{1}{2}$  gm. of material indicated and 7-hr exposure to air atmosphere at 1710°F. The two specimens shown in bottom row are standard uncontaminated Armco test pieces.

Timken 16 Cr—25 Ni—6 Mo alloy in contact with  $MoO_3$ ,  $V_2O_5$  and a  $V_2O_5$ — $MoO_3$  mixture in air at 1550°F and 1750°F. Of the three contaminants studied, the attack by  $V_2O_5$  alone was found to be most destructive, as shown in Fig 3, and the contamination by  $MoO_3$  alone was least destructive. Tests were made by filling drilled holes in the top of specimens with the oxide contaminants.

The accelerated oxidation in air at 1550°F of types 347 (18-8 Cb), 314 (25-20), and 304 (18-8) stainless steels in contact with  $V_2O_5$  was also studied by Gervais,<sup>15</sup> and is illustrated in Fig 4. The increased attack in the vicinity of the drilled hole containing the contaminant is readily visible in the lightly repolished section shown at the right. Note the relative increase in attack in the vicinity somewhat removed from the hole.

The accelerating effect of certain contaminants in causing increased oxidation of metals was investigated further. Various low-melting metal

TABLE II

## OIL ASH RESIDUES

Compound	Percent
$V_2O_5$	66.6
$Na_2O$	8.7
$SO_3$	12.8
$N_2O$	5.2
$Fe_2O_3$	1.8
$Al_2O_3$	1.5
$CaO$	0.8
Remainder	1.3

oxides were placed in a shallow cavity cut into the metal surface to retain a pool of the liquefied material; however, the high surface tension of some oxides caused the entire surface to be wetted uniformly and no pool was maintained.

The oxides and oxide mixtures chosen for study are listed in Table III together with their melting points. The detrimental effect of these contaminants is evidenced in the appearance of the oxidized specimen shown in Fig 5 after a 24 hr exposure to air at 1900°F. The metal specimens in this study are type 347 stainless steel (18 CR

TABLE III  
MELTING POINTS OF OXIDES AND OXIDE MIXTURES

Name	Formula	Melting Temperatures	
		°F	°C
Vanadium Pentoxide	$V_2O_5$	1238	670
Molybdenum Trioxide	$MoO_3$	1463	795
Bismuth Trioxide	$Bi_2O_3$	1508	820
Potassium Fluoride	$KF$	1616	880
Lead Oxide	$PbO$	1630	888
Tungsten Oxide	$WO_3$	2683	1473
Mixtures (50 atomic pct each)			
$V_2O_5-MoO_3$		1325 to 1130	720 to 610
$V_2O_5-PbO$			
$V_2O_5-Bi_2O_3$			
$V_2O_5-WO_3$			
$V_2O_5-NiO$		2330 to 1170	1275 to 635

—10 Ni—1 Cr. An uncontaminated specimen is shown for comparison.

The oxides having the highest melting points appear to have the least accelerating effect, namely tungsten oxide, and oxide mixtures of vanadium pentoxide-tungsten oxide and vanadium pentoxide-nickel oxide. The oxides having the lowest melting points, however, did not cause

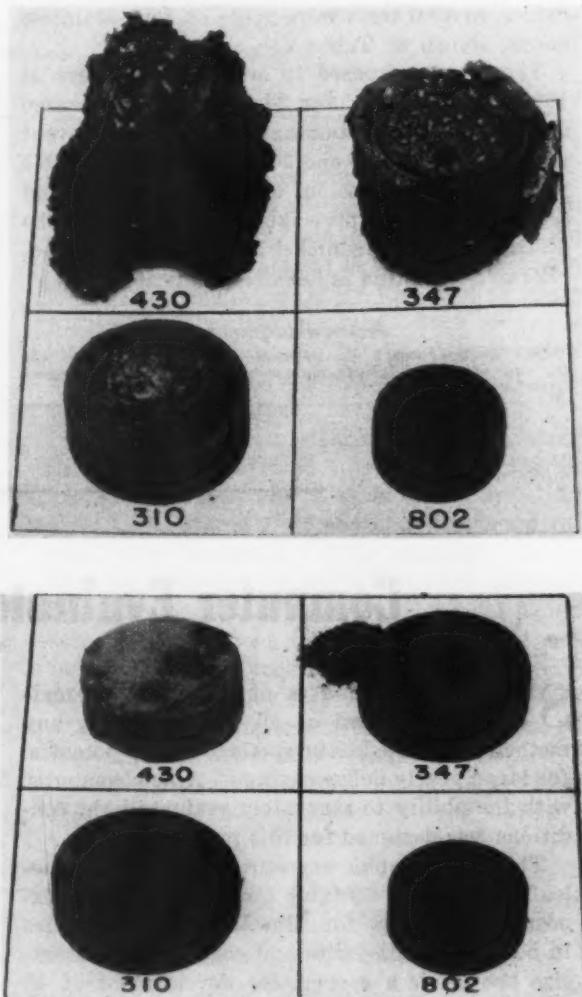
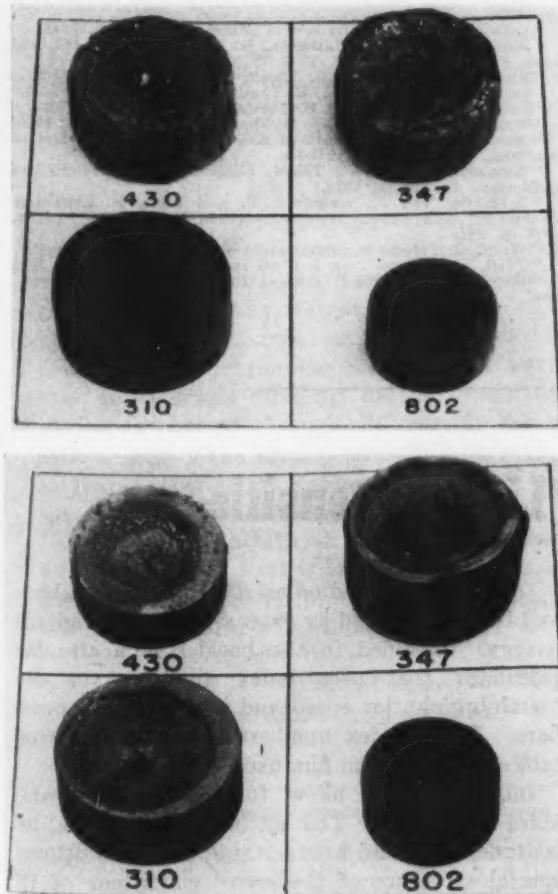


FIG. 7—Appearance of stainless alloys after contamination and subsequent air exposure at temperatures as follows: Upper left, 1800°F for 24 hr, treated with a mixture containing 20 pct KF, 30 pct NaOH, 25 pct  $H_3BO_3$ , 10 pct  $PbO$ , 5 pct  $SiO_2$ , 5 pct  $MoO_3$ , and 5 pct  $V_2O_5$ ; lower left, 1800°F for 24 hr, treated with  $PbO-V_2O_5$ ; upper right, 1900°F for 16 hr, treated with  $MoO_3-V_2O_5$ ; and lower right, 1900°F for 24 hr, uncontaminated.

## Stop Accelerated Oxidation

Continued

the greatest attack. The role played by these oxides is quite complex.

Armco iron specimens in sheet and rod form, upon which were placed  $\frac{1}{2}$  g of contaminant, as shown at the bottom of Fig 6, were placed on a porous refractory plate and inserted into a furnace at  $1710^{\circ}\text{F}$ , for 7 hr. During this time, the air corrosion was unusually severe, and the oxides formed were unusually non-adherent. They were largely composed of  $\text{Fe}_2\text{O}_3$ . The relative accelerating effects at  $1710^{\circ}\text{F}$  caused by contact with the various contaminants tested are listed in Table IV.

Boric acid exerted a protective effect while the other substances were detrimental in varying degrees. The surprisingly small accelerating effect of  $\text{MoO}_3$  is attributed to its high volatility at the test temperature, which resulted in a  $\text{MoO}_3$ -free surface after a short period of time. To illustrate the resistance of different alloys to accelerated oxidation caused by contamination with various oxides, several tests were made on four stainless alloys, shown in Table V.

These were exposed to an air atmosphere at  $1800^{\circ}\text{F}$  and  $1900^{\circ}\text{F}$  for 24 hr. The accelerated corrosion due to contamination is easily apparent in Fig 7. Types 430 and 347 are quite susceptible to accelerated corrosion, whereas alloys 310 and especially 802 are appreciably more resistant. The desirability of high nickel alloys to suppress accelerated oxidation is definitely indicated.

### Acknowledgment

The authors wish to express their gratitude to the Bureau of Ships, whose sponsorship made this research possible.

TABLE IV  
OXIDATION ACCELERATION OF ARMCO  
IRON\*

Contamination	Depth of Metal Consumed, in inches	Relative Accelerating Effect
Standard (uncontaminated) . . . . .	0.008	1.0
$\text{H}_2\text{BO}_3$ . . . . .	0.005	0.6
KF . . . . .	0.021	2.6
$\text{Bi}_2\text{O}_3$ . . . . .	0.049	6.1
$\text{MoO}_3$ . . . . .	0.011	1.4
$\text{PbO}$ . . . . .	0.022	2.8
$\text{V}_2\text{O}_5$ . . . . .	0.016	2.0

\* Tested in air at  $1710^{\circ}\text{F}$ , oxidation caused by contamination.

TABLE V  
CHEMICAL COMPOSITIONS

Designation	Percent					
	C	Cr	Ni	Si	Mn	Other*
430 . . . . .	0.12 max	16	0	1	1	1
347 . . . . .	0.08 max	18	10	1	1	1 Cb
310 . . . . .	0.25 max	25	20	1	1	
802 . . . . .	0.10 max	20	80	0	0	

\* Balance iron.

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## Computer Evaluates Light Intensities

SINCE industrial uses of film take approximately one-third of all film produced, any method that will lessen spoilage has a potential for large yearly dollar savings. A new computer with the ability to accurately evaluate light conditions was designed for this purpose.

This photographic exposure computer in loose-leaf folder form contains tables for figuring exposure conditions for films and transparencies in both black-and-white and color. This pocket-size booklet is a cooperative development of 45 national technical societies and leading manufacturers of photographic and optical equipment working through American Standards Assn. The first edition was brought out during World War II and has had world wide use.

Operation is based on existing exposure tables, and is supplemented by extensive data on radiant energy. Included in the booklet is a circular calculator that uses index numbers for determining shutter speed and lens stop or f-numbers. These index numbers are obtained from tables and from the film used.

Index numbers allow for all lighting variables including: The altitude of the sun by latitude, date, and hour; atmospheric conditions, special structure of the scene, conditions of illumination, shade, and direction of lighting. The guide evaluates light intensities and luminescence of scenes. The calculator combines this index with a film exposure index to indicate proper camera adjustment.

# Aluminum Decreases Corrosion Resistance of Austenitic Stainless



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Titanium Alloy Mfg. Div., National Lead Co., Niagara Falls, N. Y.

AUSTENITIC stainless steels of the nominal 18 pct Cr and 8 pct Ni composition are susceptible to intergranular corrosion if they are heated within the temperature range of 800°F to 1600°F. It has been shown in the classic paper of Bain, Aborn, and Rutherford<sup>1</sup> that carbides having the composition expressed by the formula Cr<sub>3</sub>C, containing approximately 94 pct Cr. and 6 pct C by weight, precipitate at the austenite grain boundaries. As these carbides precipitate the chromium content, in a narrow zone immediately adjacent to the grain boundaries, is reduced through diffusion of the carbide nuclei. The steel is no longer resistant to corrosive attack in this zone and is said to be in the sensitized condition.

In this state, attack at the grain boundaries will occur if the steel is subjected to immersion for approximately 72 hr or more in a boiling solution of sulfuric acid buffered with copper sulfate. To overcome the susceptibility of austenitic steels to intergranular attack when they are welded or otherwise heated within the sensi-

tizing range, titanium and columbium are commonly added. These elements, by virtue of their affinity for carbon, form extremely stable carbides, thus the chromium is not depleted around the grain boundaries when the steel is heated within the sensitization range. Such steels subjected to the boiling sulfuric acid-copper sulfate solution for periods up to 1000 hr are immune to intergranular attack.

Titanium stabilized steel has a high resistance to boiling concentrated nitric acid in the annealed condition, but a rather low, and often erratic, resistance if it has been subjected to a sensitizing treatment. This characteristic has been found to occur with boiling nitric acid solutions stronger than 45 pct. In weaker boiling nitric acid solutions the resistance of the steel, in the sensitized condition, is high.<sup>2</sup> Therefore the use of the Huey test to detect susceptibility of type 321 steel to intergranular or general corrosion, leaves much to be desired.

The behavior of titanium stainless steel in the Huey test is characteristic only for boiling 65

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The presence of sigma phase, rather than chromium carbide precipitation, is responsible for the low corrosion resistance of titanium stabilized austenitic stainless steels in boiling 65 pct nitric acid, when tested after sensitizing treatment. The quantity of sigma can be minimized by rather close control of the aluminum content and of the chromium and nickel contents.

pet nitric acid under laboratory conditions. The use of such data as a basis for acceptance of stainless steels for service in other media and under other conditions is questionable. No correlation of Huey test data with actual service tests has ever been reported for stabilized grades.

To investigate the effect of boiling 65 pct nitric acid on the structure of annealed and sensitized titanium stainless steel several polished specimens were immersed in boiling 65 pct acid. Microscopic observations were made after periods of immersion from 5 min to 8 hr. This procedure yielded an explanation for the poor corrosion resistance of some of the specimens in that medium. The first effect of the nitric acid was the attack and complete dissolution of the titanium nitride (so-called titanium ceno-nitride) crystals in about 15 min. The solution of the small amount of these crystals, obviously, would not account for the high weight losses encountered in the test. After 1 hr of exposure it was evident that a precipitate within the delta ferrite phase, believed to be sigma phase, had been attacked. The general microstructure of the steel was faintly visible and there was no indication of grain-boundary carbide precipitation.

#### Delta Ferrite Formed

A metallographic study of many heats of 321 steel, annealed at 1950°F showed that a small amount of delta ferrite was present in the microstructure. Examination after reheating for 2 hr at 1250°F revealed that an appreciable quantity of sigma phase is formed within the small delta ferrite pools. For an austenitic stainless steel of only 18 pct Cr the formation of sigma phase in so short a period of exposure at 1250°F was surprising.

The apparent reason for the transformation of a portion of the delta ferrite into sigma in type 321 steels is that the steels contain two very potent sigma-forming elements: titanium and aluminum. These elements, like chromium, diffuse into the delta ferrite phase, so that it is richer in these elements than the austenite phase. Higher percentages of these three elements provide the equivalent of a much higher chromium content in the ferrite. The amount of sigma which forms from the delta ferrite would be expected to increase as the contents of chromium in the ferrite increase. The amount of sigma which forms from the delta ferrite would be expected to increase as the contents of chromium, titanium, or aluminum increase.

An example of the formation of sigma, can be seen by comparing the annealed structure in Fig. 1 with the structure after reheating for 8 hr at 1250°F shown in Fig. 2. The heating at 1250°F was done in vacuum so that the identical field could be retained for the comparison. The

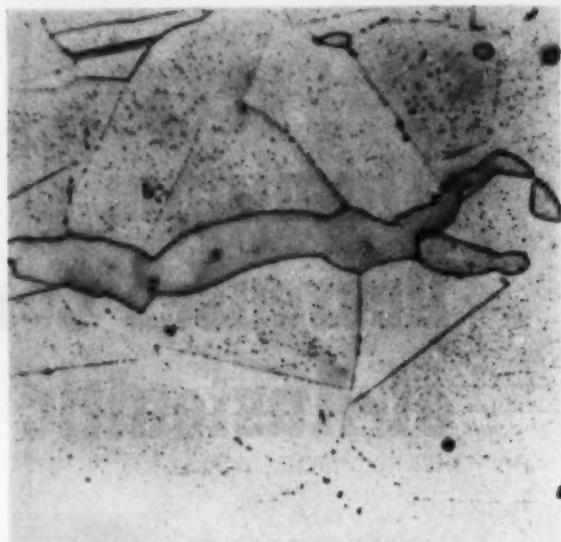


FIG. 1—Structure of a stainless steel after annealing at 1950°F. Analysis, 0.06 C, 1.37 Mn, 0.385 Si, 10.89 Ni, 19.17 Cr, 0.52 Ti and 0.14 Al. Etched electrolytically, 10 pct chromic acid, 1000X.

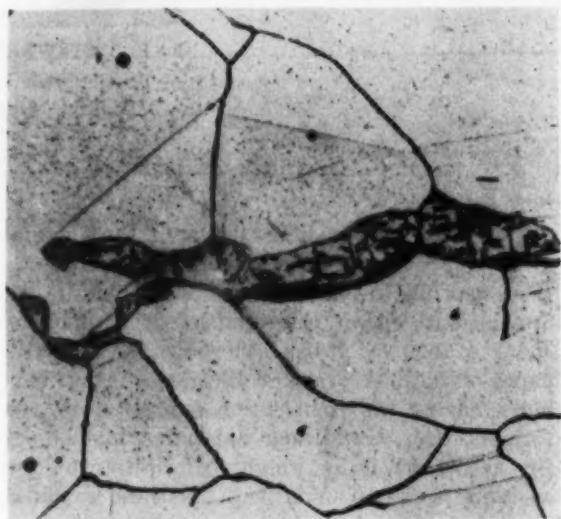


FIG. 2—Same steel as Fig. 1 after reheating for 8 hr at 1250°F in vacuum. Same etch, 1000X.

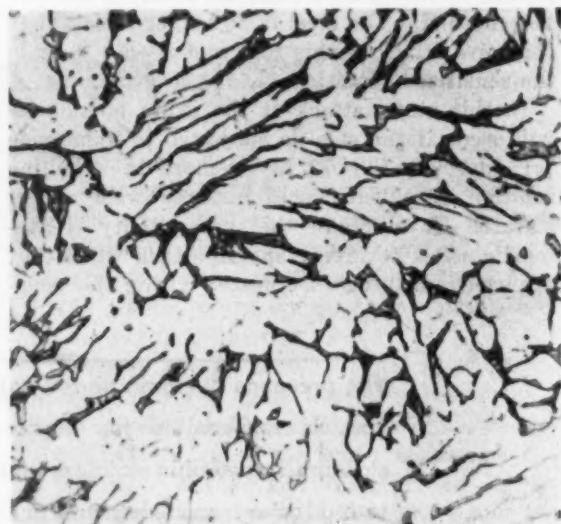


FIG. 3—Sigma phase in cast stainless containing 0.52 Al, heating for 1 hr at 1250°F. Electrolytic 10 pct sodium cyanide etch, 1000X.



FIG. 4—Same material as Fig. 3 after 24 hr heating at 1250°F. Same etch, 1000X.

structures of a cast stainless steel, as influenced by time in the sensitizing range are shown in Figs. 3 and 4.

Aluminum is always present in small and variable amounts in commercial type 321 stainless steels, but its presence is usually neglected entirely in terms of corrosion resistance. Its use in the steelmaking process is to deoxidize the molten steel prior to the addition of low carbon ferrotitanium. This deoxidation is considered

to be necessary to obtain the optimum recovery of the added titanium.

The quantity of aluminum used for deoxidation is usually of the order of 1 to 3 lb of aluminum per ton of steel. This amount is in excess of that needed to combine with the residual oxygen, or FeO, present so that some of the aluminum remains alloyed in the steel. The ferrotitanium which is added is another source of aluminum, as the low carbon ferrotitanium is made by aluminothermic methods and usually contains approximately 8 to 10 pct Al and 40 pct Ti. Most of the aluminum added as part of the ferrotitanium is recovered so that the aluminum content of the steel, from both sources, is often 20 to 40 pct of the titanium content.

To investigate the influence of aluminum on the microstructure and corrosion resistance of sensitized titanium stainless steel, 30 lb heats were made in the laboratory high-frequency induction furnace. In most cases, only the aluminum content was varied. Aluminum was varied accurately and independently of the titanium content. Sufficient titanium was added to combine with 0.020 pct N<sub>2</sub> and the 0.06 to 0.07 pct C.

#### Quantitative Tests Are Obtained

The ingots produced were forged to  $\frac{1}{2} \times 1$  in. bars which were cut into sections and annealed  $\frac{1}{2}$  hr at 1950°F, and then air cooled. They were then machined to approximately  $\frac{3}{8} \times \frac{3}{4} \times 1\frac{1}{2}$  in. specimens which were surface ground to a 120-grit finish, accurately measured and weighed, and subjected, in most instances, to three 48-hr periods of immersion in boiling 65 pct nitric. Three periods were used instead of the five periods required by the ASTM specification for this test so that quantitative data could be obtained for comparison between steels showing high and very low resistance.

Many of the specimens that yielded low weight losses after three periods were then given two additional periods. These data with the chemical compositions of the steels are given in the table. The average corrosion rates for three periods of the various steels are shown as a function of the aluminum content in Fig. 5. It is evident that the corrosion rate of each titanium stainless steel, annealed from 1250°F and reheated for 2 hr at 1250°F, increases with an increase in the aluminum content.

A slight increase in the aluminum content increases the amount of delta ferrite to a moderate degree, but markedly increases the amount of sigma phase transformed from the ferrite present when the steel is reheated for 2 hr at 1250°F. The microstructures of material taken from three ingots of one heat are shown in Fig. 6. The only variable is the aluminum content, the percentages of which are 0.015, 0.14 and 0.36.

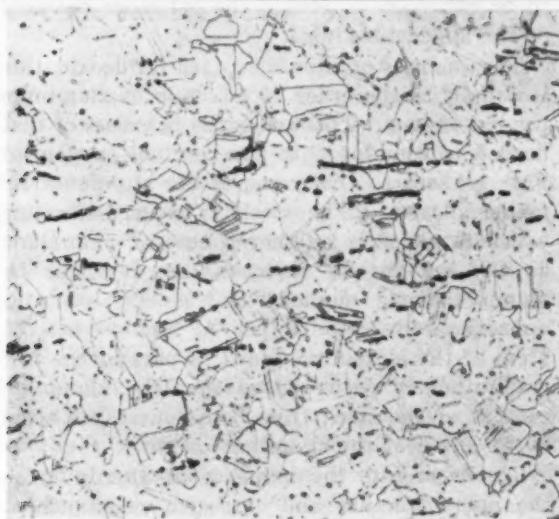
Besides the formation of sigma in the delta ferrite, sigma is also found in a few scattered areas in some of the grain boundaries, prin-

#### STEEL ANALYSES

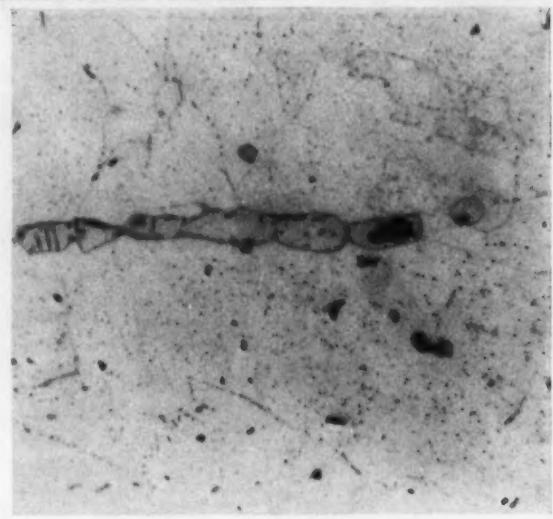
Chemical Composition and Corrosion Tests in Boiling 65 pct Nitric Acid for Titanium Stainless Steels Annealed at 1950°F and Sensitized 2 Hr at 1250°F

Heat No.	Chemical Analysis								Corrosion Rate, Inches per Month	
	C	Mn	Si	Ni	Cr	Ti	Al	Ti, C	Ave. 3 to 48 Hr Periods	Ave. 5 to 48 Hr Periods
1177-1	0.000	1.37	0.30	10.89	19.17	0.52	0.015	8.7	0.00247	0.00772
-2	0.058	.....	.....	.....	.....	0.52	0.14	9.0	0.0174	0.0314
-3	0.062	.....	.....	.....	.....	0.63	0.30	10.1	0.0099	.....
1179-1	0.059	1.50	0.27	10.45	19.96	0.55	0.015	9.3	0.0209	0.0495
-2	0.060	.....	.....	.....	.....	0.56	0.15	9.3	0.0175	.....
-3	0.060	.....	.....	.....	.....	0.54	0.27	9.0	0.0094	.....
1187-1	0.057	1.22	0.34	11.56	18.00	0.56	0.01	9.8	0.00111	0.0140
-2	0.057	.....	.....	.....	.....	0.63	0.10	11.0	0.00998	0.0182
-3	0.068	.....	.....	.....	.....	0.61	0.26	9.3	0.0187	.....
1189-1	0.062	1.35	0.43	10.27	18.24	0.54	0.01	8.7	0.00319	.....
-3	0.074	.....	.....	.....	.....	0.68	0.08	8.8	0.0346	.....
1190-1	0.065	1.53	0.48	10.43	20.52	0.61	0.01	9.4	0.0318	.....
-2	0.062	.....	.....	.....	.....	0.68	0.05	10.1	0.0221	.....
-3	0.065	.....	.....	.....	.....	0.58	0.13	8.9	0.105	.....
1225-1	0.058	1.38	0.44	11.98	18.27	0.67	0.01	12.0	0.00090	0.00210
-2	0.057	.....	.....	.....	.....	0.59	0.32	10.3	0.01518	0.00760
-3	0.067	.....	.....	.....	.....	0.68	0.28	7.8	0.0220	.....
1234-1	0.063	1.35	0.39	10.11	17.64	0.56	0.01	8.9	0.00117	0.00413
-2	0.058	.....	.....	.....	.....	0.60	0.01	10.3	0.00080	0.00349
1294-1	0.072	1.48	0.68	10.10	18.02	0.50	0.05	8.9	0.00147	0.00542
-2	0.072	.....	.....	.....	.....	0.58	0.28	7.8	0.0220	.....
1344	0.062	1.44	0.53	10.91	18.30	0.58	0.03	9.4	0.00268	0.00619
1345	0.058	1.41	0.42	11.44	18.40	0.69	0.12	11.9	0.00452	0.00940
1301-1	0.063	1.44	0.59	10.85	18.54	0.49	0.01	7.7	0.00962	.....
-2	0.065	.....	.....	.....	.....	0.54	0.27	8.3	0.0115	.....
1425-1	0.07	1.30	0.30	10.30	18.14	0.44	0.01	8.3	0.0092	.....
-2	0.07	.....	.....	.....	.....	0.51	0.17	7.3	0.0468	.....
1426-1	0.07	1.30	0.42	10.88	18.19	0.46	0.01	8.0	0.0339	.....
-2	0.07	.....	.....	.....	.....	0.53	0.14	7.8	0.0612	.....
1427-1	0.07	1.31	0.40	11.83	18.10	0.49	0.01	7.0	0.0305	.....
-2	0.07	.....	.....	.....	.....	0.50	0.12	7.1	0.0383	.....
1438-1	0.06	1.28	0.39	10.65	19.43	0.45	0.01	7.5	0.0048	.....
-2	0.06	.....	.....	.....	.....	0.41	0.08	6.8	0.0272	.....

0.015 pct AL-corrosion rate 0.00247 in. per month (3 periods)

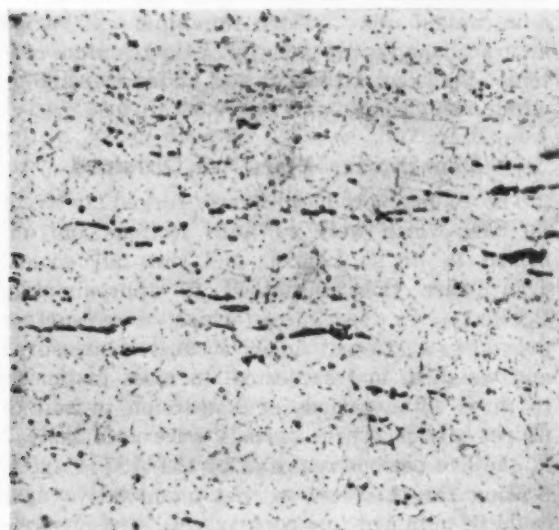


100 X



1000 X

0.14 pct AL-corrosion rate 0.0174 in. per month (3 periods)

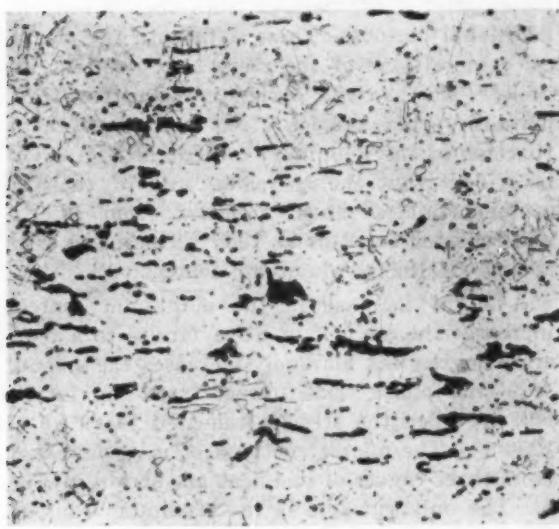


100 X

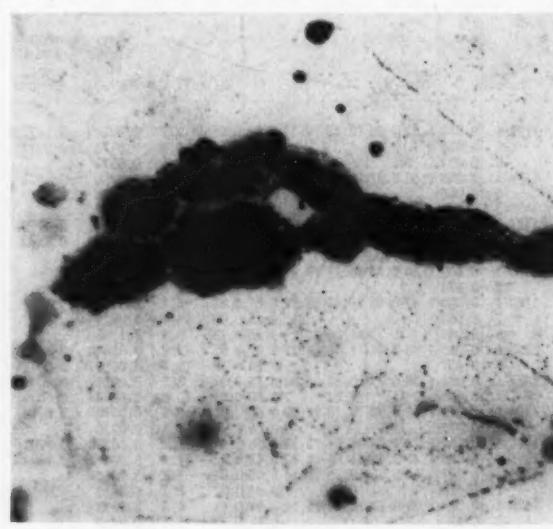


1000 X

0.36 pct AL-corrosion rate 0.0699 in. per month (3 periods)



100 X



1000 X

FIG. 6—Influence of aluminum contents in sigma formation during sensitization for 2 hr at 1250°F. Samples etched with electrolytic 10 pct chromic acid, steel analysis: 0.06C, 1.37 Mn, 0.38 Si, 10.89 Ni, 19.17 Cr, 0.52 Ti.

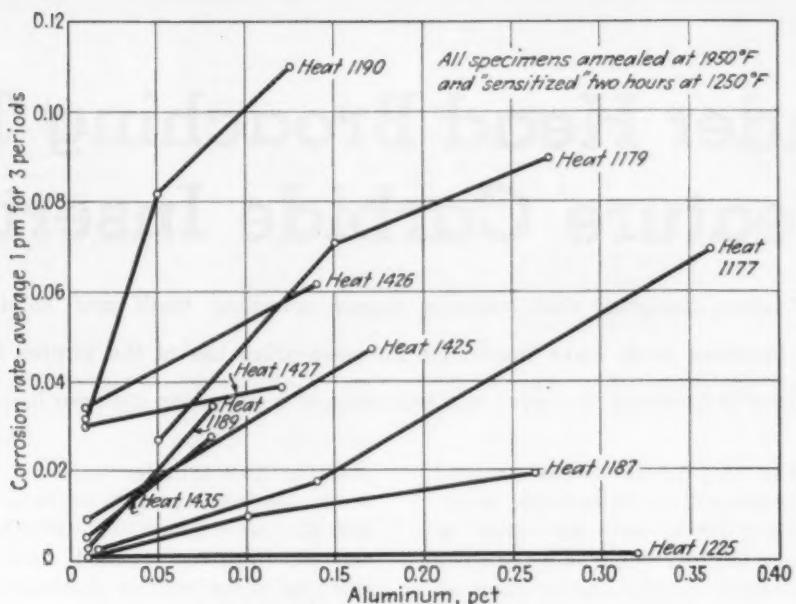


FIG. 5—Effect of aluminum content on corrosion in boiling 65 pct nitric acid.

## Corrosion of 18-8

Continued

cipally as triangular areas at the intersection of three grains. An increase in the aluminum content of the steel tends to promote the grain-boundary sigma as well as that formed in the ferrite phase.

The same grain boundary precipitate was noted a few years ago in this laboratory on specimens of type 321 steel that had been subjected to long-time exposures at 1200°F in stress-rupture testing, and identified, metallographically, as sigma phase. A similar structure was found in 18-12 + Columbium, 25-20, and 25-12 stainless steels by Clark and Freeman<sup>3</sup> who labeled it an "unknown constituent." Barnett and Troiano,<sup>4</sup> by a special etching treatment and X-ray diffraction technique, positively identified the constituent in a sample of 25-20 steel, as sigma phase.

While an increase in aluminum content is accompanied by an increase in corrosion rate, it can be seen from Fig. 6 that the influence of a given aluminum content is not the same for each steel composition tested. Considerably higher aluminum contents can be tolerated in some

steels than in others without impairing the corrosion resistance of the sensitized steel in the Huey test.

In the early stages of corrosion testing, it appeared that the corrosion resistance depended somewhat on the chromium to nickel ratio. The results for all the steels tested, however, failed to verify this hypothesis, as there were several anomalies. Variations of these elements, within their normal ranges in type 321 steel, produce relatively mild influence on the corrosion resistance of the sensitized steel to boiling 65 pct nitric acid, as compared with the effect of slight variations in aluminum content, and that of thermal treatments.

## References

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- <sup>2</sup> "Resistance of Sensitized Stainless Steels to Boiling Nitric Acid," *Metals Progress*, vol. 52, No. 6, December 1947, p. 971.
- <sup>3</sup> "The Apparent Influence of Grain Size on the High Temperature Properties of Austenitic Steels," *Trans., ASM*, vol. 38, 1947, p. 148.
- <sup>4</sup> "X-ray Identification of Sigma Phase in 25-20 Cr Ni Stainless," *Metals Progress*, vol. 53, No. 3, March 1949, p. 366.

This is an extended abstract of a paper presented during the Sigma Symposium by the authors at the ASTM 1950 Annual meeting in Atlantic City. This paper, as well as ten others on sigma phase, will be published in their entirety later this year by the American Society for Testing Materials.

# Cylinder Head Broaching Tools Feature Carbide Inserts

Broaching cutters designed with carbide tipped roughing teeth and solid carbide blade-type finishing teeth have increased between-grind life of the blades from 3000 to 65,000 pieces in finishing two faces and two sides of a gray iron cylinder head casting.

CUTTERS with single point carbide tipped roughing teeth and solid carbide blade-type finishing teeth are now used in broaching machines to broach four sides of gray cast iron cylinder heads at the engine plant of a leading automobile manufacturer.

This unique broaching cutter setup has machined more than 65,000 cylinder heads on the top side and 180,000 on the combustion chamber side, removing in excess of 240 tons of chips, before resharpening. Between-grinds life of conventional broaches averaged 3000 parts. Because of the construction of the cutter, the single point tools can be removed in a matter of minutes, as against hours required to remove and resharpen a section or more of the conventional broaches. The cylinder head finish is flat and smooth, with no crumbling of the metal around the critical edge of the combustion chamber.

The blade cuts through scale or hard spots in castings without nicking or burning. When conventional broaches were burned by hard spots, as much as 1/16 in. of metal had to be ground off to resharpen properly.

As compared with milling, the method originally used to machine the two faces and two

sides of the cylinder heads to a flat, smooth finish, the new broach permits the use of one operator to produce 600 units per 8-hr day on one machine, as against four operators per shift on three milling machines originally necessary to maintain this same production.

These special broach cutters were developed to reduce the maintenance and grinding costs incurred with conventional high speed steel broaches and to overcome the trouble caused by hard spots in castings.

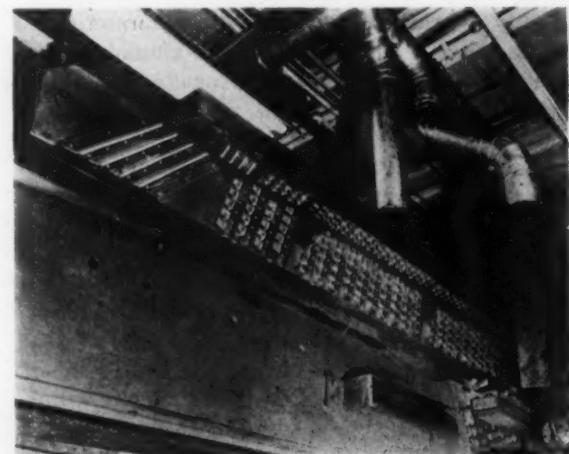
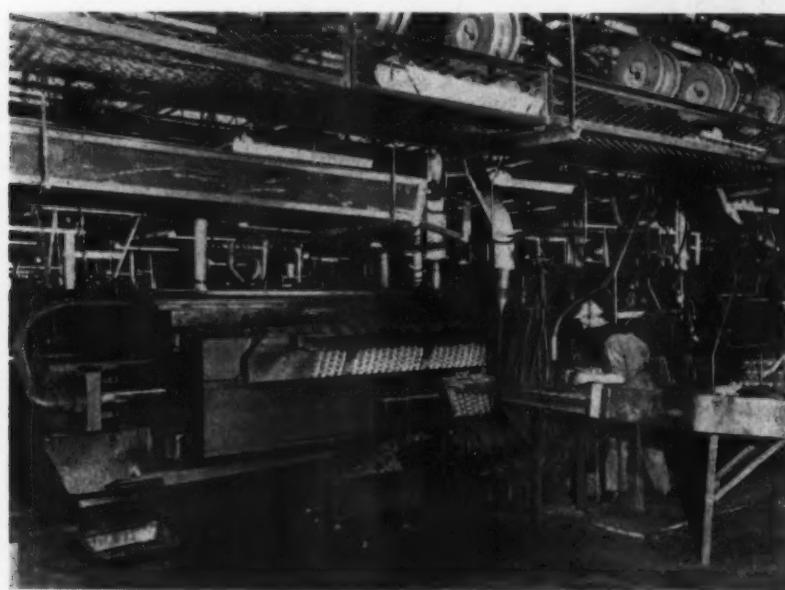


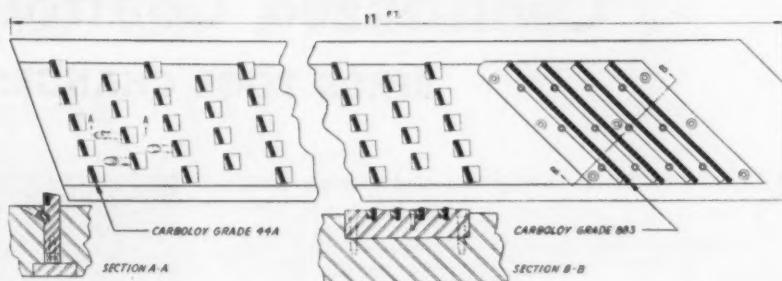
FIG. 2—The larger broaches machine the two faces of the cast iron cylinder heads. Rail broaches, similar in design to the main broaches, machine the two sides of the castings. Broaches are clamped onto the machine columns.



At Left

FIG. 1—Between-grinds life of this cylinder head broach is twenty times that of conventional broaches. It uses single point Carboly tools for roughing and semifinishing and single point Carboly blades for finishing. Each main broach is composed of four sections, each rail broach of two sections. Broaches are about 11 ft long. There are 153 tools in each main broach.

FIG. 3—This sketch shows the construction of the broach bodies. Section A-A shows how single point roughing and semifinishing tools are adjusted for height and locked in place. Section B-B shows method of holding the solid Carboloy finishing blades.



There are four broaches mounted in opposed pairs on the machine columns of a horizontal, hydraulic, push-broaching machine shown in Fig. 1. Each pair of broaches consists of a main broach for broaching one face of a cylinder head and a rail broach (Fig. 2) for broaching one side. Thus, in a single back-and-forth sweep of the machine, the top, bottom and two sides of a cylinder head are finished.

Main and rail broaches are similarly constructed. Major differences are that the main broaches are in four sections and rail broaches are in two sections. There is also a slight difference in size of the single point tools used. The total length of each broach is approximately 11 ft, and there are 153 single point tools used in each main broach. Tips are of Carboloy Grade 44A.

#### Broaches Held With Socket Screws

Each main broach has four solid carbide finishing blades, measuring  $\frac{1}{4} \times \frac{3}{4} \times 11$  in. each. Finishing blades on rail broaches are shorter. They are held in place with steel wedges and socket head screws, as shown in Fig. 3. Blades are of Carboloy Grade 883.

Broach bodies are low carbon steel plate. The backing plates, one for each cross row of single point tools, fit into slots machined into the broach bodies and are bolted to the bodies. The step of the broach is obtained by varying the height of the backing plates. Total depth of cut is approximately  $\frac{1}{8}$  in. The broach bodies, complete with single point tools and finishing blades, are fastened to the machine columns with clamps.

Rows of holes for retaining the single point carbide tools for roughing and semi-finishing are machined into the broach bodies. The tools are set square in the body, but staggered.

Tool shanks are 1 in. square in the main broaches; and  $\frac{5}{8}$  in. square in the rail broaches. To insure easy entrance of the cutting edge of the tools into the metal being broached, tool tips are set at a  $20^\circ$  shear angle; end relief angle is  $6^\circ$ , back rake is zero.

To lock the tools into the broach bodies, a screw reached from the surface of the broach is used. This screw tightens against the milled recess in the tool shank. Each tool is adjusted

for height by an adjusting screw set into the end of the shank. This screw bottoms against a back plate.

It is not necessary to remove the broach holder to sharpen individual tools. Any worn tools can be replaced with sharp tools, set to required height by individual adjusting screws. Worn tools are reground free hand and placed in stock. Since the step per tooth is a function of the backing plates, tools are identical in over-all length. Thus, one fixed gage is required to preset all tools after grinding, and only a small number of replacement tools need be carried to service the broach. Carbide finishing blades are removed as a unit and sharpened on a broach grinder when necessary.

The broach now in use machines an average of 65,000 castings on the top side and 180,000 on the combustion chamber side per grind. This average has been consistently maintained. The only tools replaced to date have been a few broken ones. Average life between grinds of broaching cutters formerly used was some 3000 units. Each 11-ft broach then had to be removed from the machine and resharpened on a surface broach grinder. Grinding the high speed steel broaches required the service of three operators for 8 hr each; and changing the broaches required 29 man hr. Thus, the new broach based on machining 65,000 heads has already eliminated 628 man hr of service time, plus the lost production while the cutters were out. Use of the carbide broaches has permitted machine speed to be increased from 45 fpm to 60 fpm.

#### One Pass Broaches Part

The rough casting weighing approximately 81 lb, is placed in the lower broaching station on the right hand side of the machine. A single sweep of the broach machines one face and one side of the cylinder head. Chips fall into a trough at the bottom of the machine and are pushed into a container at the end by the stroke of the broach. The casting is removed from this station and placed in the automatic hoist in the center of the machine. The hoist raises the casting up to the second broaching station, simultaneously turning it over into correct broaching position. The semi-machined casting is then clamped into place, and the remaining face and side are broached on the back sweep.

# Centralized Control Units

## SPEED TOOL CHANGES

**S**UBSTANTIAL savings in tool change time are being realized by plants using centralized control units. Most control units consist of (1) a master control board, (2) a master tool setting fixture, (3) a work bench, and (4) automatic tool wear counters that shut down machines when tools need changing.

These centralized control units were originally designed to expedite fast tool changes on large transfer type production lines. They are now finding acceptance wherever individual machines or groups of production machines are in operation. Various size units adapt this control technique to the size of individual operations.

In plants where Cross centralized machine control units have been installed, reported savings in tool change time are over 80 pct. These plants also report reductions in indirect labor, reduction of scrap parts, and simplified tool grinding.

The Cross control board has storage sections for each type of tool in the machine, see Fig. 1. Each section has (1) a tool setting gage, (2) a tag with tool and holder numbers, (3) storage space for two complete sets of tools and holders, and (4) a Toolometer. Tool storage sections on the control board and corresponding tool heads in the machines are keyed alphabetically. Color-coded areas on the control board point out the location of the machine heads.

### Visual Record Cuts Down Time

Toolometers provide visual records of the used and unused life of the tools in the machines. On a transfer type installation, when any one of the pointers reaches zero, the machine stops automatically. Red areas on the Toolometer dials, adjacent to the zero marks, represent danger zones and indicate the number of remaining hours of productive tool life. When one of the Toolometers stops the machine, great savings in downtime and indirect labor can be realized if all tools in the danger zone are replaced.

Tools are assembled in adjustable holders and pre-set to standard lengths with gages stored in the control board, see Fig. 2. These gages are used in conjunction with the master tool setting fixture attached to the work bench. Tools placed in the control board are ready for use when needed. Two sets of tools are provided so that if one tool is damaged during installation, a second one is available and no time is lost.

The decrease in downtime results from the fact that tools are pre-set to standard lengths and can be used for replacement without machine adjustments. Time studies show that changing of a pre-set tool requires only 2 min as compared

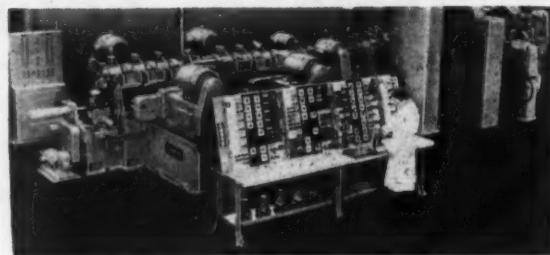


FIG. 1—Centralized machine control boards give visual indications of individual tool wear and automatically stop machines when tool changes are necessary.

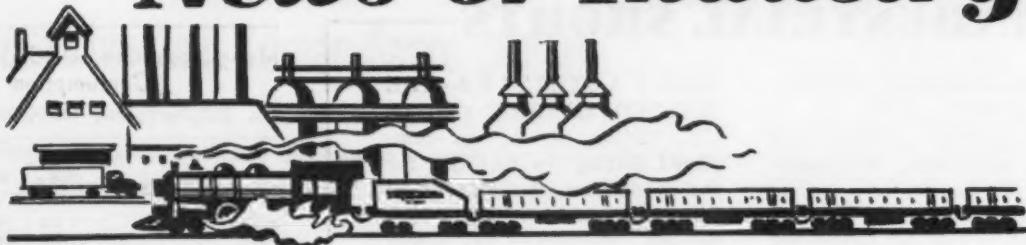
with 7 min for a conventional tool change. Added to this saving is the economy of changing tools in groups. For example, with 10 min needed for stopping and starting a machine, downtime for changing one pre-set tool is 12 min. For ten pre-set tools it is 30 min—a saving of 9 min per tool. Therefore, the combination of pre-set tools and grouped tool changes saves 14 min. This amounts to an 82 pct saving in tool change time per tool.

Other advantages gained from the use of the centralized machine control units include a reduction of scrap production and a decrease in time required for tool grinding. Tools systematically replaced do not lose size since they are not allowed to operate beyond their normal life expectancy. For this reason, tool grinding becomes a sharpening instead of a salvaging process. In these cases, it is unnecessary to grind up to 1/16 of an inch from the end of the tools in order to restore the cutting edge. A few thousands of an inch is sufficient when tools are not over-run.



FIG. 2—Tools for all machine heads are pre-set with two types of gages and stored for future use in the control board.

# News of Industry



## Bethlehem to Develop Brazilian Manganese

**Will form company with Icomi; Bethlehem owning 49 pct, Icomi owning 51 pct . . . Deposits may total 10 to 20 million tons . . . First exports planned for 1952-53.**

**Sao Paulo, Brazil**—One bright ray shining through the gloom cast by the discontinuance of manganese ore imports from the U.S.S.R. is an agreement between Bethlehem Steel Corp. and a Brazilian firm, Industria e Comercio de Minérios (Icomi), for the development of large manganese deposits in the lower Amazon Valley.

A total of 17 deposits have been discovered in Amapa Territory since 1941 and the proven superficial ore deposits total 3,810,000 metric tons. Speculation places the total of the reserves at 10,000,000 to 20,000,000 tons assaying 44 pct manganese or better.

### Export by '53 Clause

Under a 50-year concession granted to Icomi by the Territorial Government, prospecting must be completed and exporting begun by Dec. 31, 1953. The minimum quantity of ore to be exported was set at 20,000 metric tons annually; this is equivalent to 8000 short tons of contained manganese.

If prospecting proves the existence of 5,000,000 tons of high-grade ore, a minimum of 50,000 metric tons must be exported (20,000 short tons of contained manganese) and if the deposits should exceed 10,000,000 tons, exports up to 500,000 metric tons a year (200,000 tons of contained manganese) would be permitted.

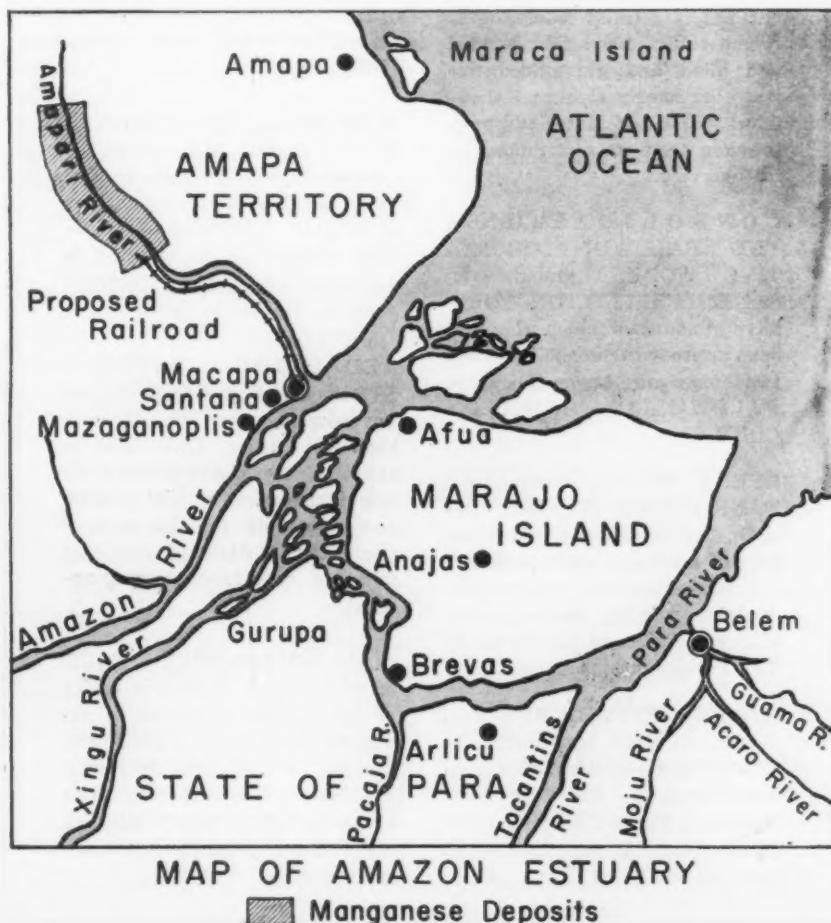
A new firm for the development of the deposits will be formed and ownership will be 51 pct by Icomi and 49 pct by Bethlehem. The

manganese will also be divided in that ratio. The new company will be financed by a \$35 million loan from the International Bank for Reconstruction and Development, and the loan will be guaranteed by the Brazilian Government.

President Dutra has already requested authorization from the

Brazilian Congress for the guarantee. It is felt in some circles that this guarantee will be enough to protect Bethlehem from arbitrary expropriation, discriminatory taxation, and burdensome social regulations. The International Bank also requires Bethlehem to absorb the entire production of Amapa if necessary.

With prompt approval by the Brazilian Congress, it is thought that exports of manganese ore will begin in 1952-53 with 300,000 metric tons the first year—later boosted to 500,000 tons annually. The Amapa Territorial Govern-



## INDUSTRIAL SHORTS

**PREFAB HOUSES** — GUNNISON HOMES, INC., U. S. STEEL CORP. prefabricated housing subsidiary, will manufacture 500 houses to be erected in Louisville over the next 3 years at a cost of \$3,500,000. The project is the largest single development ever undertaken comprised entirely of GUNNISON houses. Work will start immediately with 50 homes slated for completion by Nov. 1.

**ORE PIER PLANS** — CANTON CO., a subsidiary of PENN-ROAD CORP., plans to spend \$1 million for improvements to its lower ore pier in Baltimore harbor. The program is being undertaken in anticipation of Liberian ore movement through Port of Baltimore to REPUBLIC STEEL CORP.'S plants.

**LINE EXPANDED** — ZIEGLER STEEL SERVICE CO. of Los Angeles and Oakland is now offering a complete range of sizes of band edge strip, round and flat bar, and mild steel angles in hot-rolled, hot-rolled pickled and oiled and galvanized finishes. Formerly steel and aluminum sheets and plates had been the sole products distributed by this service.

**CONSOLIDATION** — THE BALDWIN LOCOMOTIVE WORKS, Philadelphia, and LIMA-HAMILTON CORP. have announced that a plan has been approved to consolidate the two companies under the name BALDWIN-LIMA-HAMILTON CORP.

**OPENS OFFICE** — GRAVER TANK & MFG. CO., East Chicago, Ind., fabricators and erectors of steel and alloy plate for the petroleum and process industries, recently opened a district sales office in Cincinnati at 426 Transportation Bldg.

**MOVES** — JEFFREY MFG. CO., Columbus, Ohio, has moved its West Virginia district office from Huntington to 403 City Ave., Beckley. The JEFFREY office in Cleveland is now located at 1560 Hanna Bldg.

**NEW FACILITIES** — THE WELDED CARBIDE TOOL CO., Clifton, N. J., has completed setting up facilities for the production of carbide powders, tools and dies by a new process. Production has begun on a new coarse tungsten carbide powder which is used for abrasion resistant surfaces.

**METALLURGY MEDAL** — Dr. Charles Sanborn Barrett, research professor in the Institute for the Study of Metals, University of Chicago, was named recipient of the Francis J. Clamer Medal by The Franklin Institute. The award is made for meritorious achievement in the field of metallurgy.

**CONTROLLERS GATHER** — Russell L. Peters, treasurer of INLAND STEEL CO., Chicago, will be chairman of an industry conference of controllers of metals manufacturing concerns, held in conjunction with the Controllers Institute of America convention in Chicago, Sept. 17-20.

**ELECTRODE EXPANSION** — Pending formal approval of arrangement with TVA for supply of power, National Carbon Div. of UNION CARBIDE & CARBON CORP. is considering a major expansion of its electrode plant at Columbia, Tenn.

**REOPENING** — REPUBLIC STEEL CORP. has reopened the government-owned No. 3 melt shop in Canton, Ohio, and is operating two of five 70-ton electric furnaces. The No. 3 shop has been idle for the past 2 years and REPUBLIC reopened it under lease from the government.

**FORD OPEN HOUSE** — FORD MOTOR CO. is holding a series of Open House programs to acquaint families of FORD employees with manufacturing processes. The schedule lists visits to glass plant, plastics plant, gear plant and pressed steel plant.

### Manganese Ore, U. S. Imports for Consumption (Short Tons, Mn Content)

Source	1948	1949	1st Qtr. 1950
Belgian Congo	1,371	3,191	118
Brazil	71,561	88,017	8,840
Chile	4,927	8,670	423
Cuba	15,931	27,313	11,474
Gold Coast	112,503	139,473	49,874
India	152,852	172,504	58,389
Mexico	23,694	23,771	2,828
Philippines, Rep. of	5,099	8,943	284
Union of So. Africa	130,114	122,188	43,882
U.S.S.R.	182,458	71,358	3,138
Total	702,211	864,092	178,741

\* Total import figures include small imports from minor producing countries not otherwise listed.

Sources: U. S. Dept. of Commerce.

ment is slated to receive royalties equal to 4 pct of the ore's f.o.b. value.

Suitable transportation facilities do not now exist, but by the construction of a 6.8-mile canal between Porto Grande and Porto Limao, five trips per month could be made by 500-ton barges, each transporting 2500 tons of ore a month at a cost of about \$2.50 a ton. The difficulty here is that water transport is possible only during the 5-month rainy season, an unavoidable limitation.

By contract, Icomi is required to build a 136-mile railroad from the mines to a suitable port provided 10,000,000 tons of ore are proven by prospecting. The railroad would be built through open, level terrain and it is expected that most of the \$35 million loan will be spent on its construction and rolling stock and on port facilities.

However, two shipping firms have already offered to take on the job of building the port installations.

### Jessop Reorganization Okayed

Washington, Pa. — The Jessop Steel Co. reorganization plan was given final approval in the Washington County Courts at a hearing on July 31. Creditors and shareholders had previously approved the plan. The company can now secure an already authorized \$1 million RFC loan and will acquire facilities now leased from the War Assets Administration.

## Midwest Firms Join Korean Scare Buying

**Military orders still about normal but wild race for supplies pushes up delivery schedules . . . Order backlogs fatten . . . All industries are affected**—By Gene Beaudet.

**Chicago**—The conflagration in Korea with its resultant wave of consumer buying in this country, has started many manufacturing companies in the Midwest area in a wild race for supplies. Although only a negligible amount of government orders over and above normal requirements have been received, manufacturers are finding it increasingly difficult to meet delivery schedules and their purchasing agents are finding it harder than ever to obtain raw materials and repair parts. It seems everyone wants to get under the wire with their purchases.

### Order Dates Advance

During the last 7 weeks the purchasing policies of most companies have been altered. Greater order backlogs have increased lead-times making it necessary for industrial buyers to advance their order dates 30 to 60 days further ahead than before the Korean outbreak.

Some companies are jumping a whole quarter ahead on some items depending on its critical availability. It's not so much a question of ordering for inventory in anticipation of increased orders, but rather to be certain they will be able to fill orders they now have on hand.

In many cases the advanced ordering dates are not due to a manufacturer's own backlog, but that of his suppliers. If a company normally ordered supplies in November for delivery at the end of the year they are buying them now to insure delivery at that time. The idea is to get on the supplier's backlog so that they won't be left out at a future date. A few are padding their orders to make up for increasingly late deliveries. They figure if the order after this one is late, they will have bought enough to tide them over.

While buyers are trying to fill orders, plant managers are going over the manufacturing equipment to determine when repair parts will be needed and then checking parts makers for delivery on the items. Since parts makers are dependent on an ever tightening steel supply they are telling their customers to order while they can.

This practice is extended to all

### Detroit Continues High Pace

**Detroit**—Automobile sales records continue to be broken at every turn. Buick sales for the first 7 months are up more than 100,000 vehicles according to the latest report. Deliveries of Buicks during the last period of July show an increase of 59 pct over July of last year. Nash reports its sales are up 78 pct and Oldsmobile has reported a gain of 35 pct in July, establishing the largest July sales on record. For the year to date, Olds sales are running 47 pct ahead of the first 7 months of last year.

industries and all types of purchases. Paper bags for packing paint pigments are now being ordered 45 days ahead instead of 25. Delivery of paper cartons now takes 7 weeks instead of 7 days. Buyers of heavy chemicals are scraping the barrel for such products as caustic soda. Industrial trucks, fairly easy to get a month ago, are now quoting a 3 month delivery and are almost impossible to rent.

Where the race will end no one knows. Many quarters feel that it will keep getting worse until the government steps in with priorities and allocations and disqualifies some from the running.

### Award Lake Vessels Contracts

**Cleveland**—Pittsburgh Steamship Co. has awarded the building contracts for its three new iron ore carrying vessels (THE IRON AGE, Aug. 10, 1950, p. 92). Two of the three will be constructed by the American Ship Building Co., Lorain, Ohio, and the third by the Great Lakes Engineering Works at its River Rouge, Mich., yards. A fourth limestone-hauling vessel, announced for the Bradley Transportation Co., another U. S. Steel subsidiary, will be built by the Manitowoc-Shipbuilding Co., Manitowoc, Wis.

### Cooperation Will Pay Off

**Washington**—No changes will be made in procurement procedures for the expanding defense program. But it was made plain last week that firms which have worked out production schedules with the Munitions Board will have the edge on others in obtaining the larger volume negotiated contracts.

This was brought out in a repeated Defense Dept. warning that coming to Washington for defense contracts is not only useless and unnecessary but slows down the program as well.

Information on contract bids is made available at all Commerce Dept. field offices and at the military field procurement offices. Subcontractors should go directly to the prime contractors whose names will be furnished by these same offices.

The bigger and more complicated negotiated contracts according to Munitions Board chairman Howard, "will be placed so far as possible with firms which have agreed to production schedules under the production allocation program."

### RFC Sells Warren Equipment

Glassport, Pa. — Copperweld Steel Co. bought all the facilities of its Warren, Ohio, plant, which were built during World War II by the RFC, for \$2 million. The three electric furnaces, annealing furnaces, reheat presses, and 40 acres of land which changed hands had previously been under lease to the company.

The exchange will not immediately boost company output at Warren, said president F. R. S. Kaplan, but it will permit them to make alterations and improvements. A national security clause makes the equipment available for defense work.

### Aluminum Production To Rise as Old Plants Reopen

Washington — A 100,000-ton-a-year increase in aluminum production is predicted by the Munitions Board as the result of "de-mothballing" unused producing capacity.

The government last week approved the sale of producing equipment in idle plants at Riverbank, Calif., and Burlington, N. J., to Apex Smelting Co., of Chicago; Harvey Machine Co., of Torrance, Calif.; Reynolds Metals Co., for its Jones Mills, Ark., plant, and Kaiser Chemical & Aluminum Corp., for a new plant to be built in Ohio, near New Haven, W. Va.

### Apex Enters Field

Apex is buying one line of pots and one line of rectifiers to be installed in a new plant in Oklahoma near Grand River Dam. This will mark the entrance of Apex into primary aluminum production.

Harvey is buying one line of rectifiers. The firm at present operates an extrusion plant, but will begin production of aluminum at a new plant to be built near Hungry Horse Dam, Mont.

The Munitions Board told the buyers it expected new production from the additional equipment to be forthcoming within a year. In some cases, the new production may be rolling as early as next March, the board said.

## Runaway Market Threatened in Scrap Trade

**Market is strong but confused . . . Mills desperately try to hold prices down or break peak . . . Present trends indicate last break was unrealistic.** —By Bill Lloyd

Cleveland — Demand for scrap, particularly No. 1 heavy melting steel, was temporarily in excess of supply this week in most major consuming points, as prices soared to what may prove to be a critical level.

The market is very strong, but it is also confused, making it unduly sensitive to factors which it is sometimes able to ignore, such as sales to big converters and the industrial lists.

Underlying the present demand for tonnage is the terrific melt and the fact that this is the traditional time for consumers to start stockpiling winter requirements.

For the past 3 weeks, the market has been reacting to these and other factors, including the competition of foundries for choice material in several consuming points.

Fortunate indeed are the mills that the converters' capacity is relatively limited and shortages of electric power are holding others in at their present level of consumption.

With the price of No. 1 heavy at \$46 in the Valley this week, some people feel that a \$50 market is in the making. This is an abnormal price for scrap by any yardstick, including the price of pig iron.

### Mills Trying to Hold

Some of the major mills have been trying to hold the market down for understandable reasons. Some have been willing to buy only specific tonnages on the ground, thus not disturbing the so-called regular market through broker coverage. Others have dropped out of the market and called for shipments on their \$41, \$42, \$43 orders and are getting it from some of the brokers despite a loss conservatively estimated at a dollar or two per ton.

But the willingness to pay a price for a specific tonnage has had and

will continue to have a highly stimulating effect on the trade. Despite the best laid plans of buyer and seller, the word gets around.

For reasons best known to themselves, some members of the trade have arbitrarily picked \$50 as the turning point between price control and free trade. If the price of No. 1 tops \$50, the theory goes, controls are as good as invoked.

This sort of hocus-pocus is typical of the hysterical state of the scrap market at the present time.

It is doubtful that mills want to see controls on scrap now or any other time, for that could mean controls on finished steel.

### Lay Blame on New Taxes

In any event, it has been said in some scrap circles that the prospect of higher taxes next year has inspired many an operator in the business to hold out for all he can get.

If this is true in intent, the tonnage available in most scrap yards is insufficient to underwrite the purpose.

Perhaps what is going on in the scrap market is that good tonnage rises to a new economic level in a period of peak demand, such as the present time. Buyers have been known to say that higher prices don't make any more scrap, which in a literal sense may be true, but past experiences indicate that tonnage begins to pour forth when the price of No. 1 hits \$46 to \$48, better known as the resistance point.

Such prospects, in the light of present developments, make the price break of a month ago appear rather unrealistic. Some of the high priced orders put out during the last rise have never been canceled and the business at \$43 and under that the brokers took during the interim period has cost them money.

Thus the hope of some factors in this market must be to get the price up to \$50 and break it.

Working toward this end is a characteristic of the market that more tonnage comes out on the way down, after a break, than on the way up.

Were they permitted the option of collective action, mills' prospects for breaking this market are rather poor. A possible way to do it would be to bring in a large tonnage of foreign scrap, perhaps a million tons. This would pose a first-class

procurement and transportation dilemma.

A second and completely remote cure would be for Korea to clear up, demand for steel to tumble, thus permitting a drop in operations. This is about as likely now as the capitulation of Moscow.

Meanwhile, as though guided by the old maxim that there's no shortage of scrap at a price, the market is spiralling upward, looking more and more like a new and unavoidable evil in periods of peak demand for steel.

### Plane Output to Grow

New York—Suddenly developed military spending for aircraft at the prodding of the Korean emergency may cause the work force of the aircraft industry to mushroom to 500,000 by the summer of 1951 from a pre-Korean war level of 254,000, predicts the Aircraft Industries Assn. During World War II, aircraft employment, including plant and parts makers and subcontractors, topped 2 million and in the pre-war period was about 50,000.

## West Coast Mills to Expand Rolling Capacity

**Columbia mill at Pittsburg, Calif., will add 215,000 net tons of sheets and tinplate capacity . . . Geneva, Utah, mill will produce added 100,000 net tons of hot-rolled sheets.**

**San Francisco** — The West Coast's lusty young industrial giant whose broad appetite for finished steel products has not been sated by local production will get a further stimulus to growth when Columbia and Geneva steel companies add 315,000 net tons of rolling capacity to jack up their total to 640,000 net tons of sheets and tin plates per year. (THE IRON AGE, Aug. 10, 1950, p. 61). The two U. S. Steel subsidiaries announced their expansion plans last Tuesday.

Spotlighting the current national defense program and the need of the West Coast for a modern source of supply located in the center of the market as motives for building, the joint announcement emphasized that expansion of Columbia Steel at Pittsburg, Calif., would not disturb plans to build new facilities "in the not distant future in the Los Angeles district."

### To Enlarge Plant

Columbia, which recently leased steelmaking facilities of the government-owned foundry at Pittsburg, will add cold reduced sheet and tin plate facilities to the tune of 215,000 net tons a year. The Geneva plant, Geneva, Utah, will

erect new facilities for an additional output of 100,000 net tons of hot-rolled sheets annually.

Pittsburg's cold reduction sheet and tin plate mill, placed into operation 2 years ago, will be enlarged to house new equipment including a continuous pickler, a 4-stand cold reduction mill for cold-rolling steel up to 54 in. wide; an electrolytic cleaning line; an electrolytic tinning line; four additional coil annealing furnaces; a side trim and recoil line; and a continuous sheet galvanizer. The

### Celler on War Probe Bandwagon

**Washington** — The list of congressional committees probing industry's part in the war effort had grown to 12 this week.

Rep. Celler, D., N. Y., is the latest to climb aboard the Capitol Hill bandwagon of "war investigations." He said he was directing his committee to stop looking for monopoly in business and to concentrate on "industrial practices which impede defense production."

Celler said his new investigation, which would "avoid sensationalism and unsubstantiated charges," would be centered around

last will be an innovation for the West Coast.

As before, the Geneva mill will continue to supply the Columbia sheet and tin mill with breakdown steel coils. New sheet facilities at Geneva will be installed in a new building. Construction at both U. S. Steel sites will begin almost immediately and be completed by mid-summer of 1951.

The wartime-built Geneva steel plant was bought from the government in 1946. During its peace-time operations numerous new finishing and other facilities were added. Geneva ships hot-rolled coils to Pittsburgh for conversion.

It is expected that when the Los Angeles mill is constructed, Geneva will also serve it as a supplier of hot-rolled coils.

these subjects: Patent pooling, restrictive production and marketing agreements, cartel agreements, secret industrial agreements, unjustified disclosure of information of a military nature extending from industrial agreements, and patent suppression.

### National's Net Nearly Doubles

**Pittsburgh** — Second quarter net income of National Supply Co. was \$1,655,543 compared with \$849,674 in the first quarter. Sales of \$34,834,054 compared with \$31,151,617 for the first 3 months of the year. Earnings for the half totaled \$2,505,217.

## Texas Plant Now Producing Large Size Welded Steel Pipe

**Houston**—The country's oil and gas industries will soon be receiving badly needed shipments of large diameter welded steel pipe now that the \$5 million plant of the A. O. Smith Corp. of Texas has begun production. The pipe plant, second largest of its kind in the world, is owned jointly by the A. O. Smith Corp. of Milwaukee, and the Sheffield Steel Corp., a subsidiary of Armeo Steel Corp.

The plant is scheduled to reach production of approximately 40,000 tons of pipe per month in October, according to D. F. Smith, vice president and general manager of the company. It is equipped at present to make pipe in sizes from 16 to 36 in. Facilities will be added later to increase the size range from 8½ to 36 in.

Order backlogs on hand will keep the plant busy until well into 1951. It is now tooled up to produce 1000 miles of 30 in. pipe for the Texas-Illinois Pipe Line Co. Part

of the order is already being shipped and the rest will be produced within the next 11 months.

## Westinghouse Appliance Plant Now Employs 8000 on Double Shift

**Mansfield, Ohio**—Electric household appliances are coming off the assembly lines of Westinghouse Electric Corp.'s plant here at capacity operation speed after 500 workers were added to a work force of 7500.

Working on two shifts, the plant is producing refrigerators, automatic washing machines, and electric ranges on a 6-day week basis. Other lines are operating on a 5-day week schedule.

Stating that price levels were being maintained, T. J. Newcomb, division sales manager, said that demand for Westinghouse products could not be met and orders are on an allotment basis. He expected that capacity operation would run through August and into September.

## Pittsburgh Steel Purchases High Lift Blooming Slabbing Mill

**Pittsburgh**—Pittsburgh Steel Co. has purchased a high lift blooming slabbing mill from United Engineering & Foundry Co. for installation at its Monessen, Pa. plant, Avery C. Adams, president, announced.

This mill will have a rolling capacity in excess of the company's ingot capacity and will produce a wide range of semi-finished products such as slabs, blooms and tube rounds. It will be driven by two 3500 hp motors.

Pittsburgh Steel Co.'s new mill will create a better balance between the company's semi-finished and finished product capacity, and will be the foundation for further diversification of products.

It is understood that the new blooming slabbing mill will be operating within the next 8 to 10 months, and that installation will not interfere with the company's shipments of its finished products to its customers.

### STEEL PRODUCTION (Ingots and Steel for Castings)

As Reported to the American Iron & Steel Institute

Period	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL		Calculated Weekly Production (Net Tons)	Number of Weeks in Month
	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity	Net Tons	Percent of Capacity		
January, 1950	7,131,519	96.5	379,252	80.6	419,801	71.9	7,930,372	93.9	1,790,152	4.43
February	6,142,178	92.0	255,585	60.2	395,502	75.0	6,793,245	89.1	1,688,311	4.00
March	6,747,680	91.3	265,726	56.5	473,630	81.1	7,487,036	88.7	1,680,076	4.43
1st Quarter	20,021,377	93.3	900,543	65.9	1,288,733	76.0	22,210,653	90.6	1,727,111	12.66
April	7,314,733	102.2	407,909	89.5	490,030	86.7	8,212,672	100.4	1,914,376	4.29
May	7,597,837	102.8	437,056	92.9	517,044	86.6	8,551,087	101.3	1,930,448	4.43
June	7,218,570	100.9	406,944	89.3	506,001	89.5	8,131,515	98.4	1,885,458	4.29
2nd Quarter	22,131,140	102.0	1,251,889	90.6	1,513,075	88.2	24,896,074	100.4	1,913,611	13.01
*1st 6 months	42,152,517	97.7	2,152,402	78.3	2,801,808	82.2	47,106,727	95.5	1,820,902	25.87
†July	7,227,795	97.0	380,317	79.8	479,498	79.8	8,067,610	94.9	1,828,776	4.42

Note—The percentages of capacity operated in the first 6 months are calculated on weekly capacities of 1,668,287 net tons open hearth, 106,195 net tons Bessemer and 131,708 net tons electric ingots and steel for castings, total 1,806,288 net tons; based on annual capacities as of January 1, 1950 as follows: Open hearth 86,984,400 net tons, Bessemer 5,537,000 net tons, Electric 6,871,310 net tons, total 98,392,800 net tons. Beginning July 1, 1950, the percentages of capacity operated are calculated on weekly capacities of 1,685,059 net tons open hearth, 107,806 net tons Bessemer and 135,856 net tons electric ingots and steel for castings, total 1,926,721 net tons; based on annual capacities as of July 1, 1950 as follows: Open hearth 87,858,990 net tons, Bessemer 5,621,000 net tons, Electric 7,083,510 net tons, total 100,563,500 net tons.

\* Revised.

† Preliminary figures, subject to revision.

January, 1949	7,289,865	101.2	406,552	92.6	498,973	96.1	8,197,390	100.4	1,850,427	4.43
February	6,633,765	102.0	379,688	95.3	478,478	102.0	7,493,942	101.6	1,873,485	4.00
March	7,476,139	103.7	430,176	97.5	495,481	95.4	8,401,796	102.9	1,896,568	4.43
1st Quarter	21,401,769	102.3	1,218,426	95.2	1,472,933	97.7	24,093,128	101.6	1,873,494	12.86
April	7,017,712	100.6	404,095	94.6	374,358	74.4	7,796,165	98.6	1,817,288	4.29
May	6,891,283	95.6	400,741	90.9	306,956	59.1	7,598,990	93.0	1,715,348	4.43
June	5,956,402	85.4	349,196	81.8	199,058	39.6	6,504,656	82.2	1,516,237	4.29
2nd Quarter	19,865,407	93.9	1,154,032	89.1	880,372	57.7	21,899,811	91.3	1,883,306	13.01
1st 6 months	41,267,176	98.1	2,372,458	92.1	2,353,305	77.6	45,992,939	96.4	1,777,848	25.87
July	5,309,060	73.8	300,236	68.2	175,535	33.9	5,784,831	71.0	1,308,785	4.42
August	6,103,326	84.7	355,335	80.6	264,110	50.9	6,722,771	82.3	1,517,556	4.43
September	5,994,100	86.1	350,282	82.2	253,553	50.5	6,597,935	83.6	1,541,574	4.28
3rd Quarter	17,406,486	81.5	1,005,853	76.9	683,198	45.0	19,105,537	76.9	1,455,106	13.13
9 months	58,673,662	92.5	3,378,311	87.0	3,046,503	66.6	65,098,476	90.5	1,669,192	39.00
October	814,618	11.3			113,729	21.9	928,347	11.4	209,559	4.43
November	3,806,870	54.6	172,270	40.3	243,989	48.5	4,223,129	53.4	984,412	4.29
December	5,853,653	96.7	396,075	90.0	378,496	73.0	7,728,224	94.8	1,748,467	4.42
4th Quarter	11,575,141	54.2	568,345	43.4	736,214	47.8	12,879,700	53.2	980,190	13.14
2nd 6 months	28,981,627	87.8	1,574,198	60.2	1,429,412	46.4	31,985,237	86.0	1,217,558	26.27
Total	70,248,803	82.8	3,946,656	76.0	3,782,717	61.9	77,978,176	81.1	1,495,554	52.14

Note—The percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons Bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of January 1, 1949 as follows: Open hearth 84,817,040 net tons, Bessemer 5,191,000 net tons, Electric 6,112,890 net tons, total 96,120,930 net tons.

## NSRB's Symington Picks 12 For Mobilization Policy Group

Washington — Chairman W. Stuart Symington of the National Security Resources Board has announced the names of 12 advisors on the Board's Committee on Mobilization Policy. The Committee was chosen after conferences with groups representing industry, labor, agriculture, and the public generally.

Mr. Symington named committee members as follows:

### Industry:

Marion B. Folsom, Rochester, New York, chairman of the board of the Committee for Economic Development and treasurer of the Eastman Kodak Co.; Otto A. Seyforth, Lake Harbor, Michigan, president of the U. S. Chamber of Commerce and president and director of the West Michigan Steel Foundry Co., and Austin Trailer Equipment Co., Muskegon, Michigan; Claude Adams Putnam, Keene, New Hampshire, president of the National Assn. of Manufacturers and president of the Markem Machine Co.

### Labor:

William Green, Coshocton, Ohio, president of the American Federation of Labor; Albert J. Hayes, Washington, D. C., president of the International Association of Machinists; Philip Murray, Pittsburgh, Pa., president of the Congress of Industrial Organizations.

### Agriculture:

Albert S. Goss, Washington, D. C., Master of the National Grange; Murray D. Lincoln, Columbus, Ohio, president of the Farm Bureau Mutual Automobile Insurance Co.; James G. Patton, Washington, D. C., president of the National Farmers Educational and Cooperative Union.

### Public:

Frank P. Graham, Chapel Hill, N. C., United States Senator; George H. Mead, Dayton, Ohio, member (1947-49) of the Commission on Reorganization of the Executive Branch of the Government; Mrs. Anna M. Rosenberg, New York, N. Y., labor relations authority, and special consultant on manpower problems to the National Security Resources Board.

## Dow Chemical's Open House Visits Include New Plant Tour

Midland, Mich.—Open house visits for employees, the press, and industrialists at Dow Chemical Co.'s 400-building, 785-acre plant here include a tour of the latest addition to the works, a fifth power plant that started operation last Apr. 9.

The boilers, generating steam at

1250 psi, and the 30,000-kw turbine, operating at 830°F, are housed in a single room where enough space has been provided for addition of two more boilers and another turbine.

The boilers use forced draft blowers instead of conventional induced and forced draft fans. Turbines do not run condensing

and 100 pct makeup water is needed. Other plant features include: an air drier inlet fan that blows 70,000 cu ft of hot air through the coal drier; a 1000-ft conveyor belt that delivers 160 tons of crushed coal per hour to boilers; cyclone type burners; secondary furnace to receive molten ash; and a hydrogen-cooled generator.

## CCC Orders \$20 Million Worth of Grain Bins

Asks 45 day delivery for grain bins of semi-permanent type . . . To hold 88,826,040 bu of price support grains . . . Of total bins, 12,450 will be steel and 7516 aluminum.

Pittsburgh—At a time when fabricators are setting up an unabating hue and cry for flat-rolled products, the Dept. of Agriculture's Commodity Credit Corp. last week spread out about \$20 million in orders for over 20 million bins to contain 88,826,040 bu of grain that it will receive this fall under the price support program.

The awards were made as a follow-up to the CCC's announcement on July 14 that preparations were in the making to buy additional storage facilities (THE IRON AGE, July 13, 1950, p. 109). Of the total, 12,450 will be of the steel round bin type, 7516, aluminum round bin, 100 aluminum-wood flat type, and 700 wooden bins. All will be of a semi-permanent type that can be dismantled and converted to other uses. The CCC orders call for delivery within 45 days. The average cost of per bu capacity for erected storage is about 22½¢.

### Priority Last Year

Last year's grain bin program for 32,410 steel bins, 6010 aluminum, and 17,985, wood and cement was given priority by producers who indicated that they would deliver 80 pct of the bins within the 30-day order period (THE IRON AGE, Sept. 15, 1949, p. 123). The steel supply then was fairly easy except in galvanized sheets and the program made deep inroads into the available supply.

Today the steel supply situation

is grave and the supply of galvanized is tighter. Firms using galvanized who are outside the government order fold will again feel the program's effect since the bin program will again enjoy priority. Fortunately for them the 1950 program is smaller.

A description of CCC awards follows:

### Types and Names of Companies

	No. of Structures	Total Cap.
<b>Steel (Round Bins)</b>		
Black-Sivals & Bryson, Inc., Kansas City, Mo.	2,000	6,500,000
Black-Sivals & Bryson, Inc., Kansas City, Mo.	1,000	2,710,000
Beatrice Steel Tank Mfg. Co., Beatrice, Neb.	1,000	3,250,000
Columbian Steel Tank Co., Kansas City, Mo.	1,500	4,860,000
Columbian Steel Tank Co., Kansas City, Mo.	700	2,268,000
Killy Steel Co., Anniston, Ala.	1,500	4,875,000
Butler Mfg. Co., Kansas City, Mo.	2,750	9,075,000
Steelcraft Mfg. Co., Ross-moyne, Ohio	1,000	3,250,000
Western Engineering & Constr. Co., Minneapolis.	1,000	3,258,000
<b>Total Steel Round Bins</b>	<b>12,450</b>	<b>40,046,000</b>

### Aluminum (Round Bins)

Bishop Mfg. Co., Carlisle, Iowa	300	975,000
Edwards Mfg. Co., Cincinnati, Ohio	2,000	6,500,000
Fox Metal Products Corp., Ft. Logan, Colo.	1,000	4,375,000
Gemco Engineering & Mfg. Co., Cincinnati, Ohio	1,500	7,633,500
Paterson-Heaton Inc., Los Angeles, Calif.	500	2,544,500
Columbian Steel Tank Co., Kansas City, Mo.	216	699,840
Butler Mfg. Co., Kansas City, Mo.	2,000	6,552,000
<b>Total Aluminum Round Bins</b>	<b>7,516</b>	<b>29,279,840</b>

### Aluminum-Wood (Flat Type Storage)

J. R. Cantrall Co. 7, Ar-cadia, Calif.	50	2,945,000
J. R. Cantrall Co. 7, Ar-cadia, Calif.	50	2,936,000
<b>Total Aluminum-Wood Flat Type</b>	<b>100</b>	<b>5,884,000</b>

There were also awards for 700 wooden bins with 13,616,200 bu capacity.

**Viewing the News from**

**The ECONOMIC SIDE**

By JOSEPH STAGG LAWRENCE

**Self Restraint And Government Controls**

**A** COMBINATION of circumstances is making the imposition of strait jacket controls on business almost inevitable. This is regrettable for at least three reasons.

In the first place such controls will in no way aid the war effort. Just the contrary. The intervention of government red tape and the necessity for exasperating accommodation of bureaucratic masterminding constitute obstructive friction which will reduce output and increase cost.

In the second place the dimensions of the war effort are such that controls, even if they met with the specifications of idealists, are not necessary because the aggregate of war demands within present conceivable requirements cannot account for more than 10 pct of our total national output.

In the third place the business community itself, which together with the consuming public will be the victims of unnecessary government intervention, is providing provocation that will prove to be, within the area of politics, irresistible.

In weighing the probabilities, bear in mind that it will take more than all the votes which itching bureaucrats and artful planners can muster to pass the necessary legislation. The fact is that there are members of both parties in Congress, with no interest in promoting socialism via emergencies, who feel that they are in a measure responsible for the signal failure of American arms in the East.

When the forces of the country, whose armored punches dealt the knockout blows to the Germans in the West and the Japs in the East

only 5 years ago, are kicked about by the third rate scrubs of a rival power, it puts our Congressmen on the spot. They feel they must do something to compensate for the lack of vigilance and the failure of judgment which have led to the ignominious back-tracking in Korea.

The news from the business and commodity fronts scarcely leaves our legislators any choice in the matter of controls. The business section of every newspaper contains reports of new record corporate profits. A *Wall Street Journal* study of more than 300 early reporting companies shows that their second quarter earnings are 46.5 per cent above the same quarter of the previous year. Only two of the 21 groups showed earnings below the same quarter of 1949.

The same business sections show a steady volume of price increases. One day it is black strap molasses; the next day it is blasting powder; another day it is aluminum sheets. In some cases this may be just an honest effort within the framework of free markets to use the price mechanism for automatic rationing. In others it is clearly an effort on the part of sellers to get all that the traffic will bear.

The combination of rising prices and record profits is one which the legislators cannot ignore. Occurring as they do when the country is at war and there is a general, if mistaken, fear of shortages, it is a peremptory invitation to price control and higher corporate taxation.

It makes the role of those who are resisting an excess profits tax increasingly difficult.

It raises a grave question regarding the ability of business leaders to exercise that discerning restraint which is a part of the price they must pay for their own freedom.

**Pressure of High Demand Leads to Top Aluminum Output**

**N**ew York—Under pressure of continuing high consumer demand, the aluminum industry produced 360,707,827 lb of primary aluminum in the second quarter of 1950—12 pct over the first quarter's 322,425,008 lb and the highest quarterly tonnage since 1944, reports Donald M. White, secretary of The Aluminum Assn.

Aluminum sheet and plate shipments by member companies, which constitute 98 pct of U. S. total, were 271,157,929 lb in the second quarter, about 4.5 pct over the 259,772,157 lb shipped in the first quarter. Member firms of the Foundry Div. shipped 2,479,705 lb of permanent-mold rough castings, pistons excluded, during June. Monthly shipments, production for the first half of '50 were:

	Production of Primary Aluminum	Shipments of Aluminum Sheet and Plate
January .....	104,045,800 lbs.	69,348,384 lbs.
February .....	100,885,883 "	70,863,987 "
March .....	117,493,525 "	111,558,806 "
Total for quarter ..	322,425,008 "	259,772,157 "
April .....	116,048,542 lbs.	90,816,431 lbs.
May .....	123,858,511 "	87,339,640 "
June .....	120,800,774 "	93,001,858 "
Total for quarter ..	360,707,827 "	271,157,929 "
Combined total for first half of 1950 ..	683,132,835 "	530,930,086 "

**Dow Buys RFC Plant; Will Roll Magnesium Sheets Only**

**D**etroit—Dow Chemical Co., Midland, Mich., has purchased a government-built war plant at Madison, Ill., for \$1,500,000. The plant will be converted to the rolling of magnesium sheets, according to Dow officials. During World War II the plant was operated by Standard Steel Spring Co. and the George A. Fuller Co. for the manufacture of steel castings.

The plant consists of 110 acres of plants and auxiliary buildings and will be the first of its kind devoted exclusively to the processing of rolled magnesium sheets. During recent months Dow Chemical is reported to have doubled the capacity of its magnesium-producing plants in Texas.

## ROMANCE IN SCRAP

### STORY OF A GHOST TOWN

DAWSON, N. M.—They used to call it junk. Now the call it scrap, and it's big business.

If you doubt it's big business, visit this 46-year-old coal mining town and observe the preparations being made to dismantle it down to the bare ground.

Dawson, a thriving community until school closed in June, was sold lock, stock and barrel, except for the land, to the National Iron & Metal Co. of Phoenix, Ariz., by the Phelps Dodge Corp.

The reason? The Diesel locomotive. The coal produced at Dawson was largely sold to the Southern Pacific Railroad. The coming of Diesel-powered engines killed the market and that killed Dawson.

With the outlet for its coal gone, Phelps Dodge reluctantly had to fold up the town. It didn't have to look far for a buyer. It found one in Samuel Shapiro, president of National Iron & Metal, with whom it had done business on a smaller scale before.

Mr. Shapiro took the \$500,000 salvage operation in his stride. He had just completed disposing of 5000 tons of brass and 1000 tons of lead which he had journeyed to Japan to purchase and ship to this country.

He tells you convincingly that he has found romance in scrap. In his mind's eye he envisions some of the scrap to be salvaged in the year-long job he has undertaken at Dawson, or a skyscraper in Gotham, pagodas in the Orient, or even in the battery on your next year's automobile. Twelve years in the business have convinced him that metal is the next thing to immortal.

To be resold at Dawson is everything from a pencil sharpener to modern mining machinery and a complete mine tipple and washery.

The purchase from Phelps Dodge included three schools, a hospital, a theater, a gymnasium and all their equipment. Already 300 of the 400 houses that once housed Dawson's population have been sold to Van Roush and Dugan Guest of Albuquerque, N. M., who will resell them to be moved intact, or torn down to be reassembled elsewhere.

The town's church, donated to the Catholic Diocese by Phelps Dodge, already has been quartered and moved to a new location.

The list of materials for sale in the salvage operation reads like a mail order catalog, and then some. There is office equipment, automotive equipment and railroad cars. There are underground pipes and overhead wires.

"The only thing Phelps Dodge didn't sell us was the stock of narcotics and alcohol in the drug room of the hospital," Mr. Shapiro said. "They had to be sold under government permit to some qualified buyer."

Dawson still doesn't look like a ghost town—not until you become conscious of the absence of people, and realize that the houses are empty and other buildings closed.

There is one Dawsonite, however, still in business. He is Herb Mitchell who operates the Dawson bar. Wrecking crews can become as thirsty as mine crews, and Mitchell expects to remain in business until the demolition job is almost completed.

WHAT'S  
THE BEST WAY TO  
STRIP PAINT FROM  
METAL PARTS TOO

LARGE TO  
BE SOAKED  
IN TANKS?

See Page 3

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answers many questions that will lead you to better stripping procedures. You'll want to read more about:

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What is the best method when steam is not available? See page 7.

What is the cheapest way to strip metal parts in large volume? See page 9.

What are the best ways to prepare stripped surfaces for repainting? See page 11.

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? See page 12.

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## Australian Mill Buys Furnace

Pittsburgh—A high temperature electric furnace to anneal high silicon content steel needed for the manufacture of power transformers has been shipped to the Lysaghts New Castle Works, Australia, by the Westinghouse Electric Corp. at Meadsville, Pa.

## Appoints Scrap Defense Committee

Washington—A scrap defense advisory committee to furnish expert advice on iron and steel scrap conditions pertinent to defense has been put at the service of government agencies by the Institute of Scrap Iron & Steel, Inc., announces Stanley M. Kaplan.

## Reduced Imports, Trouble Seen in Copper Tax

**Shelving of tariff suspension bill worries fabricators, foreign copper producers . . . Senate rider attempt may be easily scuttled . . . Buyers to absorb tax**—By John Anthony.

**New York**—The vote of the Senate Finance Committee last week to table the bill for suspension of the 2¢ copper tariff has created havoc among copper fabricators, and producers of foreign copper are perplexed about how to carry on marketing operations. If this vote cannot be reversed on the floor of the Senate, the effect is more than likely to be a sharp reduction in the tonnage of foreign copper to be made available to domestic fabricators.

### Rider May Be Defeated

At the present rate of industrial activity, with business flooding in to brass and wire mills, a reduction in the nation's total supplies of

copper would work chaos in the market. Inflationary factors are already at work on the metal markets. Reduced copper imports would be sure to build inflationary pressures.

There is no doubt that an attempt will be made on the Senate floor to tack a tariff suspension rider on another measure. But observers fear that such action may be doomed to fail on a determined filibuster by mining state Senators, in view of the need for urgent action on other emergency measures.

The crux of the copper tariff problem lies in the inability of producers in Chile, supplier of 75 pct of refined copper imports and 35

pct of blister copper imports, to absorb the 2¢ duty. Otherwise a simple increase of 1¢ to 2¢ per lb in the domestic market price would resolve the problem.

A large part of the financial structure of the government of Chile is built around the copper industry. Chile taxes its copper producers at the rate of 50 pct of the price of copper above 10¢ per lb. Producers of Chilean copper say that the government would not permit them to sell copper at 2¢ less than the world market price, or in other words the delivered Connecticut Valley price minus transportation costs. So the duty on imported copper will have to be paid by the buyer.

### Problem of Independents

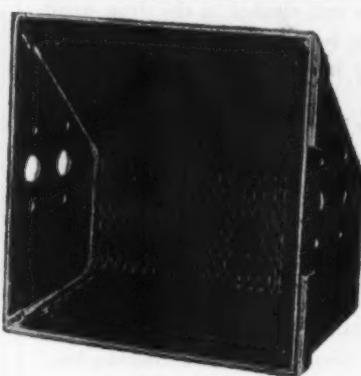
Another phase of the problem involves the relationship between copper fabricators and their suppliers. A number of the brass and wire mills are owned by copper-producing companies which are their principal suppliers of copper. But there are also independent fabricators who must rely on the open market.

Some of the major producers operate mines in this country only, and the tariff is no problem to them or to their fabricators. Others operate mines here and in Chile. The fabricating subsidiaries and outside customers of these companies will take the brunt of tariff payments. Fabricators able to buy domestic copper will have a price advantage over their competitors estimated at 1¢ to 2¢ per lb.

### Price Advance Seen

In a less active market period when copper could be sold instead of allocated, independent fabricators would flock to the domestic producers leaving foreign producers high and dry. But today fabricators consider themselves lucky to get copper, regardless of its origin. They are paying the 2¢ duty for foreign copper and absorbing the loss. The brass and wire mill industries are highly competi-

## Typical of Hendrick's Manufacturing Facilities



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perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.



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tive and operate on small profit margins.

It is no secret that absorption of the duty cannot continue very long before mill prices must be advanced. The result will be a rush of business for the low-priced sellers which they will be unable to handle. So in self defense their prices must be raised.

One of the difficult problems facing producers of foreign copper is how to distribute their foreign and domestic copper equitably. The industry would be open to charges of discrimination if subsidiaries were given priority for domestic copper.

The obvious solution that has already been advanced is to sell foreign copper in the export market. There is a ready market abroad for all the blister, fire refined and electrolytic that could be diverted. Copper could be refined here in bond and fabricated for sale abroad with a drawback allowance.

### Smoke Control Costs \$1,000,000

Detroit—Ford Motor Co. has spent more than \$1 million in its production foundry alone to curb smoke and air pollution, it has been disclosed. Major objectives of the Ford air pollution program include (1) prevention of new pollution by providing adequate smoke and dust control on all new equipment, (2) solving existing problems by installation of corrective equipment, improved operation, and development of new scientific and engineering devices to improve the situation.

In the future, all bidders for Ford equipment must furnish a statement from the City of Dearborn Smoke Inspector indicating the installation will meet the conditions outlined by new Dearborn City air pollution ordinance.

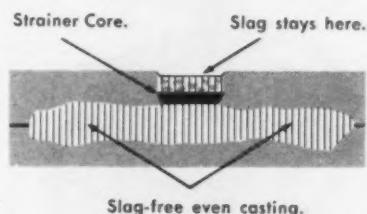
### To Preview Packard Line

Detroit—The all-new line of 1951 Packards will be previewed by Packard dealers at New York, Chicago, and San Francisco meetings to be held during the week of Aug. 21.

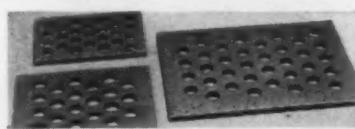
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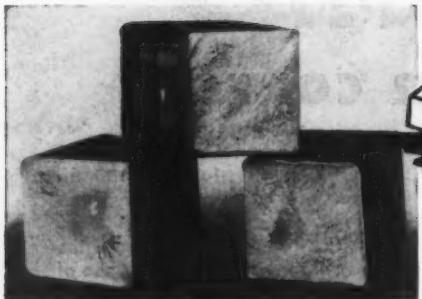
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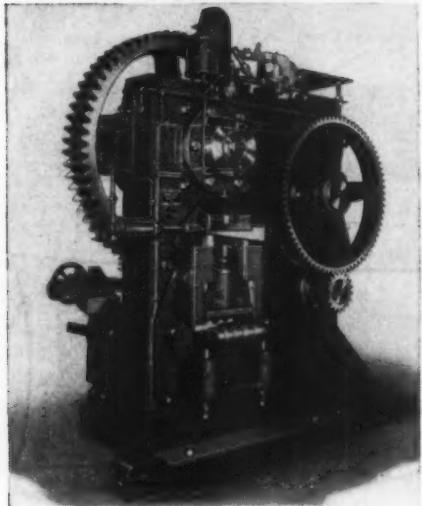
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# CLEAN, QUICK CUTS to "Pile Up" Your Profits, Too!



with "Buffalo"  
**BILLET SHEARS**



If you could see the No. 17 Shear "bite off" SIX 9" squares (.20 C. steel) in a minute, you'd see how this speed "piles up" profits! And "Buffalo" Billet Shears are built to CONTINUE delivering this fast, powerful shearing action—many are still on active 24-hour service after a good many years. A complete range of 11 sizes to meet your most particular requirements. For instance, for high production work "Buffalo" Billet Shears can be arranged for Multiple cutting, like the No. 10 shown at the left, which has air-operated clutch, counterbalance and automatic hold-down.

Write for Bulletin 3295-A

**BUFFALO FORGE COMPANY**

492 Broadway

Buffalo, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

## Start Apprentice Need Study With '48 Defense Training Program

Washington—The 1948 defense training program of the Labor Dept.'s Bureau of Apprenticeship was put into effect last week by W. F. Patterson, director, who instructed his 200 field offices to evaluate the need of specific industries for apprenticeable critical skills and determine whether enough apprentices were under training to enable expansion of production.

Field staffs have been told to urge State apprenticeship councils, local joint apprenticeship committees, unions, and employers to review the training provided for occupations on the critical list and to take necessary measures to strengthen on and off the job training.

## Must Give Way to Tanks

Detroit — National Terminals Corp. has been ordered by Federal Court to begin moving immediately out of the bomber plant at Cleveland airport to make way for tank production facilities to be installed by the Cadillac Div. of General Motors Corp.

Judge Paul Jones, granting a condemnation order on request of the Justice Dept., said the present occupant should be out of the building completely within 90 days. Cadillac Div. may begin moving in "gradually," he said.

National Terminals holds a 20-year lease starting last May 1, and will receive damages after an appraisal has been made, the Judge said. Among the customers of National Terminals is the Commodity Credit Corp. which stores navy beans and powdered milk.

## Stockpile Platinum Imported

Washington—More than a ton of platinum has arrived from Great Britain for United States stockpiling. It was purchased with ECA's 5 pct share of British counterpart funds, adding to the \$3 million worth of platinum purchased thus far from participating nations.

• News of Industry •

### July Building at New High; Home Construction Is Big Factor

Washington—Commerce Dept. figures last week indicated that July construction broke all records with the dollar volume amounting to \$2.6 billion, bringing the 7-month total to more than \$14.4 billion, also a new record.

Basis of the boom was the unusually heavy volume of residential building which amounted to \$1.1 billion for the month, nearly double last year's figures, making the total for the 7 months about \$6.4 billion as compared with \$4.2 last year. Unit figures are not yet available.

Adding to the increase has been the revival of industrial and business construction which had declined for most of 1949. Construction of factories, warehouses, offices, stores, garages, etc., is running 15 pct ahead of 1949 and amounted to more than a billion so far this year.

Public construction rose \$40 million in July to \$690 million, two-thirds of the increase going into highways. Public housing expenditures declined slightly.

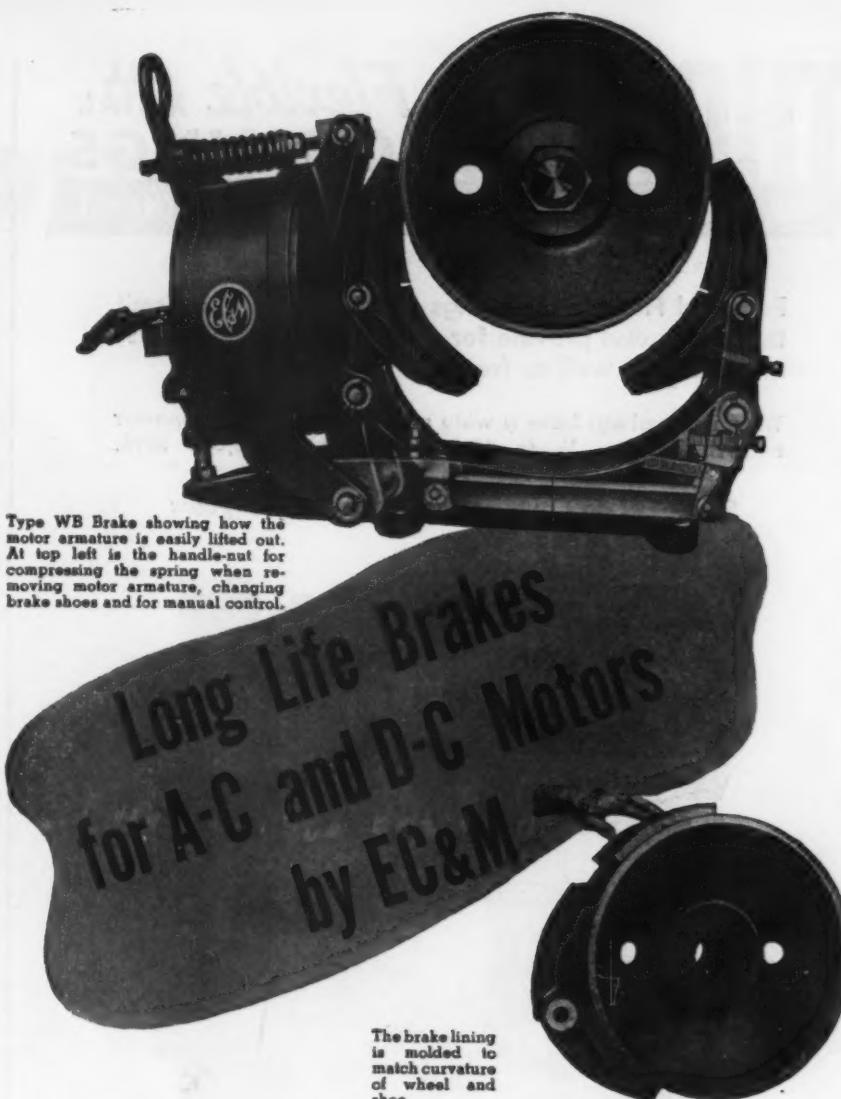
### To Build New Blast Furnace

Birmingham—Construction of a new Woodward Iron Works \$4,500,000 merchant iron blast furnace will be started here this week, reports Bradford C. Colford, president. It will have a daily capacity of 650 tons and is being built adjacent to the firm's No. 3 furnace, which it will replace.

No. 3 will be overhauled and kept on a stand-by basis. Its successor, No. 4, will produce 80,000 more tons per year. Now in the Birmingham district are 19 blast furnaces.

### Vanadium Exports Restricted

Washington—Additional destination controls have been placed on exports of ferrovanadium, vanadium ore and concentrates, vanadium metal, alloys and scrap, and vanadium flue dust.



These Type WB Brakes for a.c. and d.c. service have a block type lining which is both thick and tough.

Furthermore, due to the process of manufacture, the blocks have proper frictional quality *throughout the entire thickness* permitting uniform and complete wear down to rivet heads. And since the material is non-compressionable, brake adjustments are infrequent.

EC&M Type WB Brakes are built in several sizes. They can be supplied with series or shunt-wound operating coils for direct current motors. On alternating current service, they are supplied in shunt-wound form for use with a compact rectifier-unit. Send for Bulletins 1004 and 1006 describing these long life brakes.



Actual wearing thickness, between rivet heads and brake wheel, is  $\frac{1}{8}$ " on the smallest size to  $\frac{1}{4}$ " on the largest size.

THE ELECTRIC CONTROLLER & MFG. CO.  
2698 EAST 79th STREET • CLEVELAND 4, OHIO

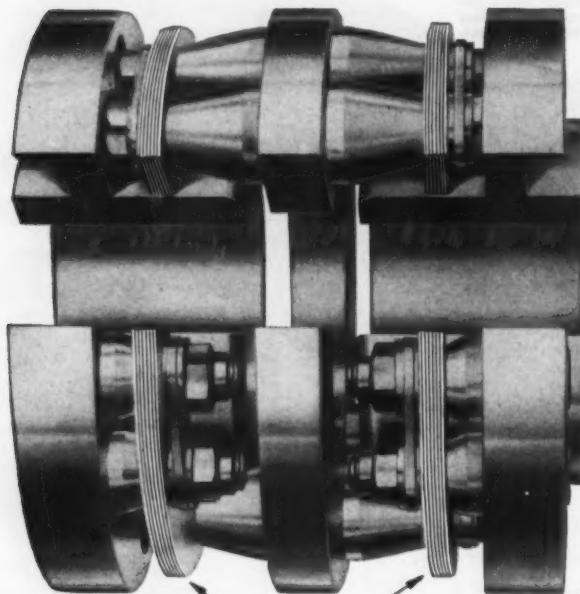
# THOMAS Flexible ALL METAL COUPLINGS

FOR POWER TRANSMISSION • REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for parallel and angular misalignment as well as free end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:  $\frac{1}{2}$  to 40,000 HP — 1 to 30,000 RPM.

Specialists on Couplings for more than 30 years



THE THOMAS PRINCIPLE GUARANTEES  
PERFECT BALANCE UNDER ALL  
CONDITIONS OF MISALIGNMENT.

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NO MAINTENANCE PROBLEMS.  
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ALL PARTS ARE  
SOLIDLY BOLTED TOGETHER.



Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.  
WARREN, PENNSYLVANIA

## • News of Industry •

### STEEL CONSTRUCTION NEWS



Fabricated steel awards this week included the following:

- 9000 Tons, Elizabeth, N. J., New Jersey Turnpike Commission, contract 44, to Poirer & McLane, New York.
- 1900 Tons, Cayuga, N. Y., New York State Dept. of Public Works, to Phoenix Bridge Co., Phoenixville, Pa.
- 1200 Tons, Philadelphia, addition to Delaware Station, Philadelphia Electric Co., to Bethlehem Steel Co., Bethlehem.
- 1000 Tons, Salem County, N. J., New Jersey Turnpike Commission, contract 40(1), S. J. Groves, Woodbridge, N. J., low bidder.
- 350 Tons, Bustleton, Pa., warehouse for Paper Manufacturers Co. to Bethlehem Steel Co., Bethlehem.
- 250 Tons, Villanova, Pa., boiler house for Villanova College, to Bethlehem Steel Co., Bethlehem.
- 230 Tons, West Point, Pa., Sharp & Dohme, to Bethlehem Steel Co., Bethlehem.
- 214 Tons, Rockford, Ill., addition to Eclipse Fuel And Engrg. Co. plant through Scandrol Construction Co., contractor, to A. C. Woods and Co., Rockford.
- 150 Tons, Falmouth, Mass., hangar at Camp Edwards, through Frankini Construction Co., Medford, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.
- 150 Tons, Windsor Locks, hangar at Windsor Locks Air Base through Frankini Construction Co., Medford, Mass., to Groisser & Shlager Iron Works, Somerville, Mass.
- 100 Tons, Birmingham, Ala., school shop building for Birmingham Board of Education, to Virginia Bridge Co., Birmingham.

Fabricated steel inquiries this week included the following:

- 3249 Tons, Crawford County, Pa., Continuous girder, I-beam bridge, divided highway. Secretary of Highways, Harrisburg, Pa. Bids due Aug. 25.
- 1450 Tons, Essex County, N. J., New Jersey Turnpike Commission, contract 42, due Aug. 22.
- 660 Tons, Schuylkill County, Pa., divided highway including bridges and structures. Secretary of Highways, Harrisburg, Pa. Bids due Aug. 18.
- 250 Tons, Morris County, N. J., New Jersey Dept. of Highways, Swinefield bridge over the Passaic River.

Reinforcing bar awards this week included the following:

- 900 Tons, Gloucester County, N. J., New Jersey Turnpike Commission, contract 53(2), through F. A. Canuso & Son, Philadelphia, to Bethlehem Steel Co., Bethlehem.
- 635 Tons, Allegheny County, Pa., turnpike section 31-B to U. S. Steel Supply Corp., Chicago.
- 532 Tons, Salem County, N. J., New Jersey Turnpike Commission, contract 40(1), S. J. Groves, Woodbridge, N. J., low bidder.
- 475 Tons, Mackinaw City, Mich., ferry slip and dock, to Sargent and Boyd.
- 430 Tons, Mankato, Minn., hospital, to Bethlehem Steel Corp.
- 400 Tons, Perry County, Pa., Pennsylvania Dept. of Highways, Nello L. Teer Co., Durham, N. C., low bidder.
- 390 Tons, Chicago, Foster Ave. bridge, to Olney J. Dean Steel Co., Chicago.
- 355 Tons, Madison, Wis., Memorial Library, to Joseph T. Ryerson And Son, Chicago.

# SPHEROIDIZED WIRE



Steel with this grain structure resists forming and is tough on wire working tools and dies.

Spheroidizing changes the free cementite in steel from elongated shapes to small nodules or spheroids thus rendering the steel soft and ductile.

By

## WICK WIRE

Where manufacturing calls for severe wire forming—it will pay you to investigate the advantages of Wickwire Spheroidized Wire. Soft and easily workable, this specially processed wire never gives your machines a "hard time"—lends itself readily to twisting, bending and swaging. Our engineers and metallurgists are always ready to help you in the correct selection and application of specialty steel wires for your particular needs. High or low carbon steel . . . round or shaped . . . in all sizes, tempers, grades and finishes—when you order wire, specify WICKWIRE.

## WICK WIRE WIRE

A PRODUCT OF WICKWIRE SPENCER STEEL DIVISION • THE COLORADO FUEL AND IRON CORPORATION

WIRE SALES OFFICE—361 Delaware Ave., Buffalo 2, N.Y. . . EXECUTIVE OFFICE—500 Fifth Ave., New York 18, N.Y.

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PACIFIC COAST SUBSIDIARY—The California Wire Cloth Corp., Oakland 6, Cal.



# P&H CRAWLER CRANES...

**all around  
the yard!**

Your biggest opportunity for cost cutting today is in materials handling in yards! You'll find no surer way to yard-wide efficiency than with a P&H Crawler Crane.

This one machine, operated by one man, gives you the fast, flexible, safe operation that pays big dividends in materials handling. You get more with P&H Added Value features. Write for literature, today.



## P&H MAGNET CRANES

For fast, low-cost scrap handling, you can't beat a P&H Crawler Crane with magnet. Quickly converts to crane, clamshell, dragline.

**P&H**

INDUSTRIAL CRAWLER CRANES  
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CORPORATION

HOISTS • WELDING ELECTRODES • MOTORS • EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

**for all-round  
materials  
handling...**

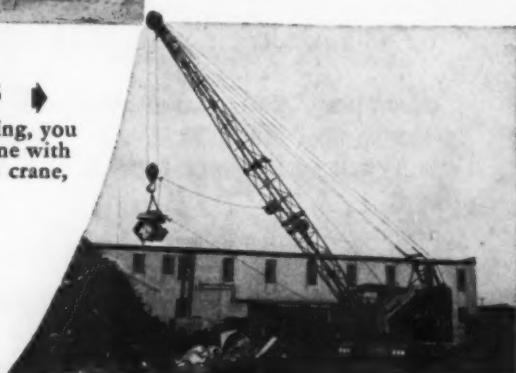


## P&H CRAWLER CRANES

Easier operation and safer handling. You'll have smooth, responsive P&H Direct Acting Hydraulic Control. Working in out-of-the-way places and close quarters . . . save time . . . save money . . . with the P&H simplified method of steering and braking.

## P&H CRAWLER CLAM SHELLS

For swifter handling of bulk materials, anywhere in the yard! Not restricted to areas served by track-age. Wide crawlers and all-weather cabs permit year-round efficient service.



P&H Industrial  
Crawler Cranes  
Built in Models for all  
Yard Requirements

## • News of Industry •

### Inland Steel Co. to Raise Steelmaking Output by 20 Pct

Chicago—Steelmaking capacity of the Inland Steel Co. will be raised from 3.75 million net tons to 4.5 million annually, a 20 pct increase, when a program of expansion announced by the company recently is completed early in 1952.

Plans call for the construction of a new openhearth shop with four 250 ton furnaces at the company's Indiana Harbor Works in East Chicago, Ind. It will include a scrap yard, charging facilities, ingot mold yard and slag yard. Present blooming mills will be able to take on increased tonnage when new soaking pits and an elevated runway to speed delivery of ingots from present openhearts are added.

The 4.5 million ton ingot capacity will be rounded out by the enlargement of some of the present openhearts, several of which can be increased from 160 to 200 ton capacities, according to company officials.

### Town Asks for H-Bomb Plant

Jasper, Ala.—While other communities balk at possibilities of getting an H-bomb plant nearby, this "distress area" would welcome the government's \$292,000,000 H-bomb plant on a 200,000-acre tract in the western part of Walker County. A 40-page brief prepared by the Jasper Chamber of Commerce proposes the site for the installation and explains its advantages.

Emphasized are vast coal reserves, industrial water, transportation, low population, and availability of a large labor supply. Military observers indicated that the land would lend itself well to camouflage and could be easily protected.

### Levine & Son Moves

New York—Henry Levine & Son, Inc., electroplating consultants, have relocated their office and laboratory. After Aug. 15 they moved to the Jackson Bldg., 153 East 26th St., N. Y.

• News of Industry •

### Stevens Heads New Conn. Machine Tool Sales Agency

Hartford—Owen C. Stevens is at the head of a newly formed Connecticut agency for the Kingsbury Machine Tool Corp., the Monarch Machine Tool Co., and the Minster Machine Co.

Mr. Stevens, previously a Stedfast & Roulston representative, has worked from Springfield, Mass., for more than 14 years and his sales and consulting experience is held in high regard. An engineering graduate of the University of Cincinnati, he has taken an active part in the Springfield chapter of the American Society of Tool Engineers of which he is a charter member.

Assisting him in the West Hartford office is Mr. W. O. Aldrich who was formerly connected with Lyman A. Smith, and is also well known in Connecticut industrial circles.

### Buys Atlas Engine Div.

Pittsburgh — To broaden its horsepower range of Diesel engines, National Supply Co. has purchased assets of the Engine Div. of Atlas Imperial Diesel Engine Co., Oakland, Cal.

Included in the purchase are certain machinery and equipment as well as inventories. National Supply will transfer production operations to its Superior Engine division, Springfield, O.

### British Automakers Set Records

London—The British automotive industry exported a record number of 102,740 cars in the second quarter. June was also a record month for exports of commercial vehicles and chassis—14,235. The total of commercial vehicles exported in the second quarter, 38,947, also set a record.



Owen C. Stevens

# GEAR WORKS

**Custom-cut**

to your  
specifications  
in production  
quantities

LET US QUOTE ON YOUR REQUIREMENTS NOW

We make—in all materials, metallic and non-metallic—Helical Gears, Bevel Gears, Spur Gears, Worm Gears, Spiral teeth, Ground Gears with shaved or ground teeth, Thread Worms.

PERKINS MACHINE & GEAR CO.  
WEST SPRINGFIELD, MASSACHUSETTS

Springfield 7-4751

MASS PRODUCTION OF HIGH  
QUALITY GEARS AT COMPETITIVE PRICES

## STAYING POWER



For hydraulic pressure, for boiler or desuperheater feed—use this Aldrich-Groff "POWR-SAVR" Controllable Capacity Pump.

ENGINEERS and plant managers — these men in particular — know that machinery must have *staying power*. Whereas breakdown or interrupted production costs money, *staying power* pays!

The automatic stroke-transforming action of the "POWR-SAVR" Pump (above) supplies only that capacity actually needed. As for mechanical reliability, over 500 of these Aldrich-Groff Units — many with as much as ten years of service — are successfully operating today.

Wherever high pressure pumping is required, use an Aldrich Pump. You, like the 500 satisfied users mentioned above, will profit from a good investment. For technical information, request Data Sheet 65.

Representatives: Birmingham • Bolivar, N.Y. • Boston • Buffalo • Chicago • Cincinnati • Cleveland • Denver • Detroit • Duluth • Houston • Jacksonville • Los Angeles • New York • Omaha • Philadelphia • Pittsburgh • Portland, Ore. • Richmond, Va. • St. Louis • San Francisco • Seattle • Spokane, Wash. • Syracuse • Tulsa

THE **ALDRICH** PUMP COMPANY

8 PINE STREET, ALLENTOWN, PENNSYLVANIA

*All Aldrich Pumps Have STAYING POWER*

### • News of Industry •

#### British Union Team Advises Setting Up Technical Departments

London — A follow-the-American-pattern theme was the gist of a report submitted by a team of British unionists that had visited the United States last year to determine the role of the American union in raising productivity. The team reported to its sponsor, the Trades Union Council, comprised of all British trade unionists, that larger unions should establish production engineering departments to protect their members and advise management on scientific practices.

#### Ohio Works to Up Production

Youngstown — Production of blast furnace iron at Carnegie-Illinois' Ohio Works will be increased by nearly 800 tons a day with the installation of two new turbo-blowers to replace obsolete equipment, announced John W. Humphrey, general plant superintendent. The project should be completed in about 10 months.

To make room, two abandoned boiler houses will be torn down. U. S. Steel's American Bridge Co. will erect a new building to house the turbo-blowers and auxiliary equipment.

Work has already begun to increase the capacity of the Ohio Works' 15 openhearth furnaces.

#### Turks Study U.S. Mine Methods

Washington — Turkey has sent 12 miners, foremen and engineers to the United States to learn modern mining techniques. Several million dollars worth of mining equipment has been acquired by that country through the Marshall Plan, particularly for the Zonguldak field on the Black Sea coast.

#### C. & O. Orders 1000 Boxcars

Chicago — An order for 1000 boxcars to be built for the Chesapeake & Ohio RR was received recently by the Pullman Standard Car Mfg. Co. The cars will be built at the company's Michigan City, Ind. plant. Pullman-Standard now has 9000 freight cars on its order books.



## No place for Rip Van Winkles

**T**WENTY years bring changes--changes far greater in our fast-moving world than ever happened in Rip Van Winkle's day.

Americans are awakening to unpalatable facts--that the enterprise system which built our nation and made it strong is being subtly undermined; that advocates of backdoor socialism and communism thrive in our midst; most dangerous of all, that our young people are misinformed on economics.

For example, a recent survey of high school seniors reveals that they estimated that it takes only an \$81 investment to provide a job. Actually, as shown by the 1947 census, the 2256 establishments of the iron and steel

industry invested \$545 per worker that year alone in new plant and equipment. Total investment to provide one job runs well above \$10,000.

These youth had a similarly distorted picture of profits. They believe shareholders receive 24% of the sales dollar whereas they receive an average of less than 3%.

Misinformed minds are a ready field for imported false philosophies. And it is up to you, a business leader in your community, to take responsibility toward correcting these misunderstandings. The American businessman must not permit himself to be lost in Rip Van Winkle befuddlement.

**The Youngstown Sheet and Tube Company**  
 General Offices--Youngstown 1, Ohio  
 Export Offices--500 Fifth Avenue, New York  
 MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS



ELECTROLYTIC TIN PLATE - COKE TIN PLATE - WIRE - COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - CONDUIT - RODS - SHEETS - PLATES - BARS - RAILROAD TRACK SPIKES.

• News of Industry •

**Plant Maintenance Show To Be Bigger and Better Next Year**

**Cleveland**—The second plant maintenance show and conference will be held in Public Auditorium here January 15 through 18, announces Clapp & Poliak, exposition management.

Present indications are that it will be two to three times the size of the initial show, it was stated. Already, 120 companies have leased booth space which exceeds by 61 pct the total area used for the first show.

Also to be repeated will be the plant maintenance conference which attracted approximately 1500 engineers and executives, one of the largest attendances recorded at technical sessions of this type.

Advance registration cards and hotel information may be obtained from Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

**Receives Shipment of Taconite**

**Cleveland**—The first shipment of taconite pellets consigned to Youngstown Sheet & Tube Co. was received recently from the Aurora, Minn., pilot plant of Pickands, Mather & Co., processors. W. H. Prescott, Jr., manager of Pickands, Mather's ore department, said it had not arrived on a commercially competitive basis but for experimentation in a small shipment.

He continued that he had hopes for favorable action on an application for sufficient water supply to operate beneficiation plants with a 10 million ton capacity. The application was filed by the Erie Mining Co., managed by Pickands.

**Gets Export-Import Bank Credit**

**Washington**—A credit of \$15 million has been established for Saudi Arabia by the Export-Import Bank. It is to be used in purchasing machinery, equipment and materials from the United States for development of transportation, power and agricultural facilities.

**We can put this**  
**STRUCTURAL STEEL**  
*anywhere  
in your plant...*  
**for an expansion or  
rebuilding program**

**W**HERE will you have your structural steel? Fort Pitt Bridge will supply the structural steel, or assume the complete responsibility for the structural steel and erection. Your job will be on time, too! On any job involving the use of structural steel for new construction or modernization, use the unexcelled fabrication facilities and experienced engineering of the Fort Pitt Bridge organization.



**"Steel Permits Streamlining Construction  
with Safety, Endurance and Economy"**

**FORT PITT BRIDGE WORKS**

Member American Institute of Steel Construction

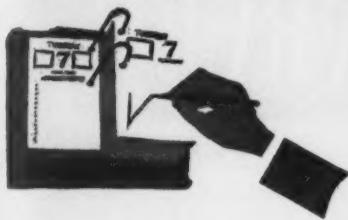
General Offices, Pittsburgh, Pa. . . . Plant at Canonsburg, Pa.

BRANCH OFFICES

NEW YORK, N.Y. . . . 441 Lexington Avenue  
CLEVELAND, OHIO . . . . Bulkley Building

COLUMBUS, OHIO . . . Huntington Bank Bldg.  
DETROIT, MICHIGAN . . . New Center Building

## Dates to Remember



Aug. 7-20—First U. S. International Trade Fair, Navy Pier, International Amphitheatre, Coliseum Arena, all in Chicago. Headquarters are at the Merchandise Mart, Merchandise Mart Plaza, Chicago.

Sept. 5-9—National Chemical Exposition, Chicago, Coliseum, Chicago. American Chemical Society, Chicago Section headquarters are at 86 E. Randolph St., Chicago.

Sept. 12-14—Society of Automotive Engineers, tractor meeting, Hotel Schroeder, Milwaukee. Society headquarters are at 29 W. 39th St., New York.

Sept. 13-15—National Petroleum Assn., annual meeting, Hotel Traymore, Atlantic City, N. J. Association headquarters are in the Munsey Bldg., Washington.

Sept. 18-22—Instrument Society of America, conference and exhibit, Memorial Auditorium, Buffalo. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 19-21—American Society of Mechanical Engineers, fall meeting, Hotel Sheraton, Worcester. Society headquarters are at 29 W. 39th St., New York.

Sept. 23-26—Packaging Machinery Manufacturers Institute, annual meeting, Homestead, Hot Springs, Va. Institute headquarters are at 242 Madison Ave., New York.

Sept. 26-29—Assn. of Iron & Steel Engineers, exposition and annual convention, Public Auditorium, Cleveland. Association headquarters are in the Empire Bldg., Pittsburgh.

Sept. 27-30—Society of Automotive Engineers, aeronautic meeting and engineering display, Biltmore Hotel, Los Angeles. Society headquarters are at 29 W. 39th St., New York.

Oct. 6-8—National Assn. of Waste Material Dealers, fall meeting, Hotel Traymore, Atlantic City, N. J. Association headquarters are in the Times Bldg., New York.

Oct. 10-12—Society of Industrial Packaging & Materials Handling Engineers, exposition, Convention Hall, Philadelphia. Society headquarters are at 20 W. Jackson Blvd., Chicago.

Oct. 12-13—Gray Iron Founders' Society, annual meeting, Netherlands Plaza Hotel, Cincinnati. Society headquarters are at 210 National City-E. 6th Bldg., Cleveland.

Oct. 16-18—Society of Automotive Engineers, transportation meeting, Hotel Statler, New York. Society headquarters are at 29 W. 39th St., New York.

Oct. 23-25—American Gear Manufacturers Assn., semiannual meeting, Edgewater Beach Hotel, Chicago. Association headquarters are in the Empire Bldg., Pittsburgh.

Oct. 23-26—American Institute of Steel Construction, annual meeting, Shamrock Hotel, Houston. Institute headquarters are at 101 Park Ave., New York.

Oct. 23-27—National Metal Congress & Exposition, International Amphitheater, Chicago. American Society for Metals headquarters are at 7301 Euclid Ave., Cleveland.



### This Record Safeguards Your Stainless and High Tensile Welding Jobs

The Arcos label is your assurance of uniformity from pound to pound and shipment to shipment. The alloy heat number and process number are stamped on every label. Together with the printed data on the label, this gives the information needed to match exactly any previous order at any time. Careful manufacturing controls and records of Arcos stainless and high tensile steel electrodes are the reason for the uniformity of Arcos weld metal in specified chemical, physical and metallurgical properties.

Get the Arcos "Reference Chart on Alloy Welding" from your distributor or write direct.

**ARCOS CORPORATION**

1500 South Fiftieth St., Philadelphia 43, Penna.

**WELD WITH**

**ARCOS**

Specialists in Stainless, Low Alloy and Non-Ferrous Electrodes.





# "ThredKut 99 smooths out tough 'PINE TREE' Broaching Job!"



Photograph Courtesy The Leopold Machine Tool Company

HERE is one of the most difficult broaching jobs that the metalworking industry has ever tackled and solved — cutting the "pine tree" shaped slot in exceptionally tough alloy steel jet engine discs.

Stuart's THREDKUT 99 has rendered outstanding service for leading manufacturers in this field. Its combination of high anti-weld and high lubricity characteristics proved to be a 100% satisfactory solution to difficulties of this job.

What is your broaching job? The toughest ones can be handled better, and the easy ones are easier with the right Stuart products! Ask for Stuart's pamphlet OILS FOR BROACHING or call your nearby Stuart representative.



Inset below. Sketch of "pine tree" slot broached in jet engine disc.



FREE

## PUBLICATIONS

Continued from Page 36

suggested procedures for restoring old drawings and eliminating hand tracing. Additional information is supplied on reproducing business forms, correspondence, and card records. *Eastman Kodak Co.*

For free copy insert No. 8 on postcard, p. 37.

## Casters and Wheels

The complete line of K & J plastic, solid rubber, semi-steel, and demountable disk wheels in hard and cushion, solid tread, semi-pneumatic rubber tire models, with plain, roller, ball, and tapered rolling bearings, in capacities of 140 to 6500 lb, are described in a new illustrated 26-p. catalog. Complete specifications are given and typical applications are shown. *Kilbourne & Jacobs Mfg. Co.*

For free copy insert No. 9 on postcard, p. 37.

## RR Car Bulkheads

Advantages of Pittsburgh ratchet and sectional steel bulkheads are outlined in a new 4-p. folder. The folder explains how these reusable bulkheads reduce damage claims, cut labor costs, save time and eliminate maintenance expense. *Pittsburgh Steel Products Co.*

For free copy insert No. 10 on postcard, p. 37.

## Field Report

A series of material handling case studies made by field men are the subjects of several new 4-p. folders outlining the problem and solution of specific applications. Results of new methods are given in statistical form and in many cases a floor plan drawing is included. All reports show installation photographs with descriptive captions. *Rapids-Standard Co., Inc.*

For free copy insert No. 11 on postcard, p. 37.

## Sand Data Shown

Sands, moisture and binders are discussed in a new 12-p. booklet telling how they affect foundry cores. Basic facts, extracted from several important research projects,

D. A. **Stuart Oil Co.**

2737 So. Troy St., Chicago 23, Illinois



## a good steer for reduced maintenance

Easy-steering Mono-Cushions soak up more bumps and jolts than any other type of industrial vehicle tire, size for size—and reduce your maintenance costs accordingly. In steering linkages, bearings, differentials, universals, transmissions — wherever shock or shock load is a factor — Mono-Cushions will save you money on repairs, cut vehicle downtime.

They'll save you money in other ways, too. Mono-Cushions will reduce your tire costs, to begin with. And they'll reduce load breakage and floor wear. They require no servicing and they're puncture-proof—go anywhere in the plant. And drivers like the easy ride and easy steering they get with Mono-Cushions.

The leading manufacturers of industrial vehicles use Mono-Cushions as original equipment. Replacement tires available through the manufacturer of your equipment or his distributors.

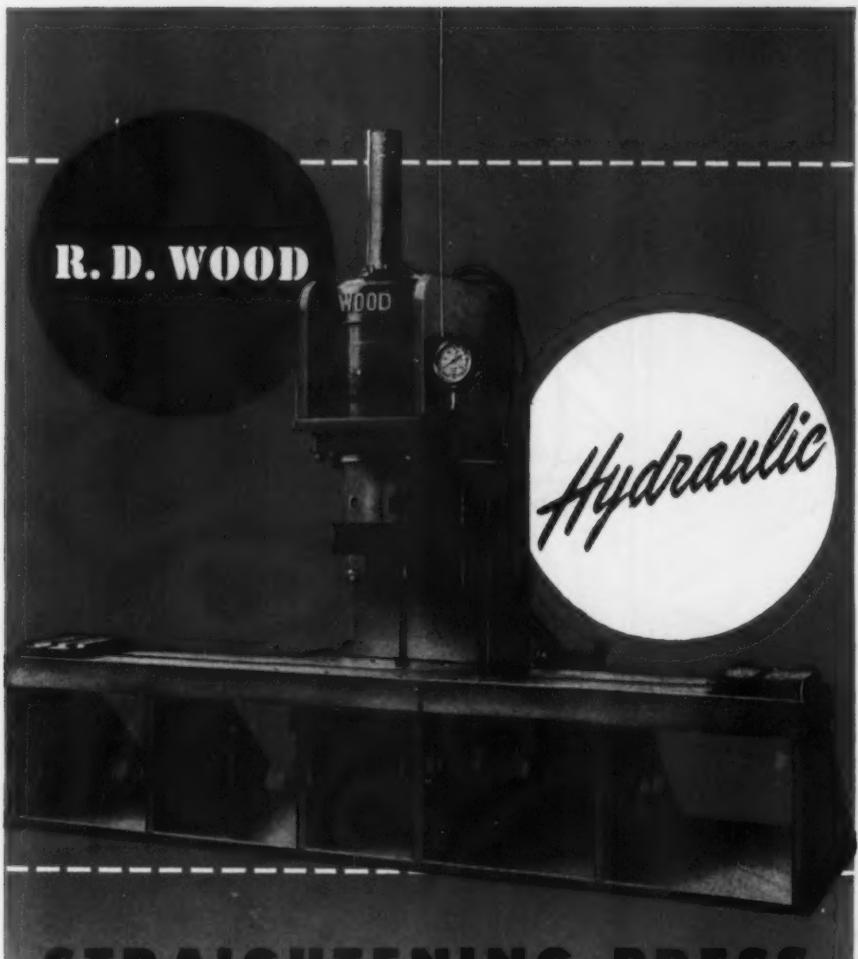
## *Mono-Cushion* INDUSTRIAL VEHICLE TIRES

TOUGH ALL THE WAY THROUGH  
CUSHION ALL THE WAY THROUGH



THE  
**MONARCH**  
RUBBER COMPANY

301 LINCOLN PARK • HARTVILLE, OHIO  
SPECIALISTS IN INDUSTRIAL SOLID TIRES  
AND MOLDED MECHANICAL RUBBER GOODS



## STRAIGHTENING PRESS

For straightening operations on bars, shafts, tubes, and similar pieces, this 100-ton vertical hydraulic open-gap straightening press does an efficient job. Its working table, measuring 22½" x 12' 4", is supplied with two bases in machined grooves for the assembly of dies or anvil blocks. The bases are moved easily in 6" increments any required distance either side of center. The ram head is grooved for die attachment.

Powered by a rear-mounted, compact two-pressure pumping unit, the press has a 12" main ram stroke, and stands 10' high. Daylight is 26½".

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HYDRAULIC PRESSES AND VALVES

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*R.D. Wood Company*

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## FREE PUBLICATIONS

*Continued*

are presented in an easily understood manner with the objective of standardizing foundry core practices and, therefore, better and cheaper castings. *Archer-Daniels-Midland Co.*

For free copy insert No. 12 on postcard, p. 37.

### Underground Mg Anodes

The cause of underground corrosion and the simple inexpensive way to long-term protection by the use of magnesium anodes is the subject of a new folder. The folder points out that magnesium is the most highly anodic of all commercial metals, and as a sacrificial or expendable anode will, when properly installed, protect all common structural metals. *Federated Metals Div., American Smelting & Refining Co.*

For free copy insert No. 13 on postcard, p. 37.

### Electric Hoists

Details of component parts of Bob-Cat electric cable hoists are shown in a new 8-p. bulletin. The many features of the equipment are described, along with specifications, prices, and information on mechanical and electrical extras. *Lisbon Hoist & Crane Co.*

For free copy insert No. 14 on postcard, p. 37.

### Hole Punching Units

Wales' new extra heavy-duty Type G hole punching units for punching holes in ½-in. thick mild steel are described and illustrated in a new 4-p. folder. The units described are independent, self-contained, and interchangeable and may be set up on templates or T-slotted plates in stamping presses and press brakes. *Wales-Strippit Corp.*

For free copy insert No. 15 on postcard, p. 37.

### Lifting Magnets

Improved Ohio lifting magnets and magnet controllers, with automatic quick-drop load and arc suppressors, are described in an illustrated new 8-p. bulletin. Installations and a variety of applications are shown, together with dimensions and capacities. *Ohio Electric Mfg. Co.*

For free copy insert No. 16 on postcard, p. 37.  
Resume Your Reading on Page 37

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Pittsburgh, Pa.

# NEW

## PRODUCTION IDEAS

(Continued from Page 40)

ed separately and has a control sequence of squeeze-weld-hold-and-off times. The machine can weld better than 520 household mixer-base units per hr. No buffing or grinding is necessary on the completed parts. *Sciaky Bros., Inc.* For more data insert No. 29 on postcard, p. 37.

### Rotary-Fixture Bender

Bends irregular shapes or true radii in tubing, bars, to 8 in. wide.

The new bender employs a horizontal bronze or steel stationary pressure pad that is air operated against a rotating type die head. The die head is mounted on a heavy vertical spindle that is gear driven



by a 7 1/2 hp motor. A variable speed motor provides die head speed variations. Limit switches and adjustable dogs control the degree of rotation of the die head during the working cycle. Starting, stopping or reversing the cycle is pushbutton-controlled. The adjustable slide mounting of the air cylinder provides the capacity for handling bends up to 7 ft diam. *Pine Engineering Co.*

For more data insert No. 30 on postcard, p. 37.

### Nipple Threading Machines

Thread, ream, and chamfer nipples in a continuous automatic operation.

Through a mechanism that transfers and turns the nipple end-for-end, threading, reaming, and chamfering operations are per-

## RADIOGRAPHY

**goes beyond inspection  
of castings and welds**

### ◀ CHECKS ASSEMBLIES

Two of a group of hydraulic cylinders failed to function. Disassembly would have taken too long and involved breaking seals. Radiography compared the two with a good cylinder and revealed not only the compression springs rubbing on cylinder walls but also the absence of a second coil spring in the valve assemblies.

### ◀ EXAMINES ENCLOSED SURFACES

Even though treated and sealed, these landing gear struts of an amphibian plane can develop internal corrosion and become weakened. Radiography alone can provide an examination of these internal surfaces. So the manufacturer has made it routine in the periodic inspection for service and safety of its amphibians.

Your x-ray dealer will gladly discuss the many ways radiography can aid your business by increasing foundry yield, checking welds and doing many other important and valuable non-destructive inspections.

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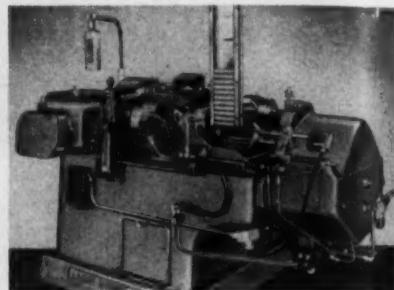
**THE CLEVELAND CAP SCREW COMPANY**  
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## NEW PRODUCTION IDEAS

*Continued*

formed on both ends of the nipples in a continual cycle. The Landmaco No. 2 machine produces commercial standard long nipples up to 6 in. in length. It is built with two size range capacities, the  $\frac{1}{2}$  and  $\frac{3}{4}$ -in. range and the 1 to 2-in.



range. Incorporating the new close nipple attachment the Landmaco No. 2 will produce commercial standard close, short, and special short nipples. The operator is required only to give the machine visual attention and to keep the magazine charged with nipple blanks. *Landis Machine Co.*

For more data insert No. 31 on postcard, p. 37.

### Demagnetizer

Device demagnetizes materials and stabilizes magnetic flux.

Any unshielded magnetically soft material, including forms of iron and steel, can be demagnetized by the demagnetizing coil. The instrument can be used to eliminate

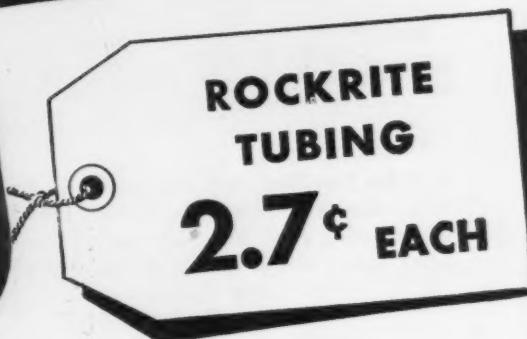
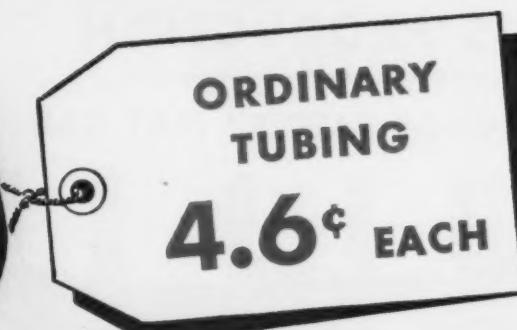


undesirable magnetic flux from tools, drills, punches, and any machined parts that may have become magnetized. It also is useful in equalizing and stabilizing magnetic flux in permanent-magnet assemblies. The demagnetizer con-

# Look at this difference in MACHINING COSTS



SAE 52100 ball bearing raceway about 2" O.D., 1/4" wall and 5/8" wide.



These startling figures were developed from actual cost records. The difference of 1.9¢ per part is the result of two important Rockrite advantages:

**SMALLER MACHINING ALLOWANCE** — That's because Rockrite Tubing is sized by a distinctively different process to *much closer tolerances* than are practical by any other method.

**BETTER MACHINABILITY OF METAL** — Because Rockrite Tubing is sized by cold-compression; has a denser, more uniform microstructure, better work surfaces — permitting higher cutting speeds and feeds. In this case machine output is some 60% higher.

The extra cost of Rockrite stock is only six-tenths of a cent per piece, and the costs shown above do not include savings in handling, coolant, rejects or magazine stocking.

Do you know the 3 requirements essential for tube accuracy and cost savings? New Bulletin R2 tells you . . . gives all the facts on close-tolerance Rockrite Tubing. Send for your copy today.



## Leads all others in these savings

- Higher cutting speeds
- Tools last longer between grinds
- Work-surface finishes are better
- Machined parts have closer tolerances
- Stations on automatics are often released for additional operations
- Extra-long pieces available—less downtime for magazine stocking and fewer scrap ends
- Closer tolerances often eliminate necessity for machining on outside or inside

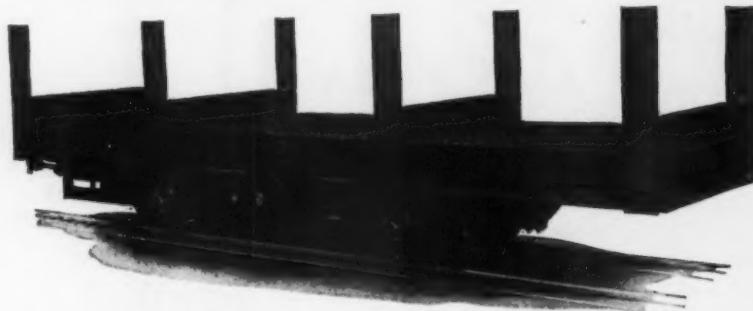
**TUBE REDUCING CORPORATION • WALLINGTON, NEW JERSEY**

TR-116

**ATLAS**

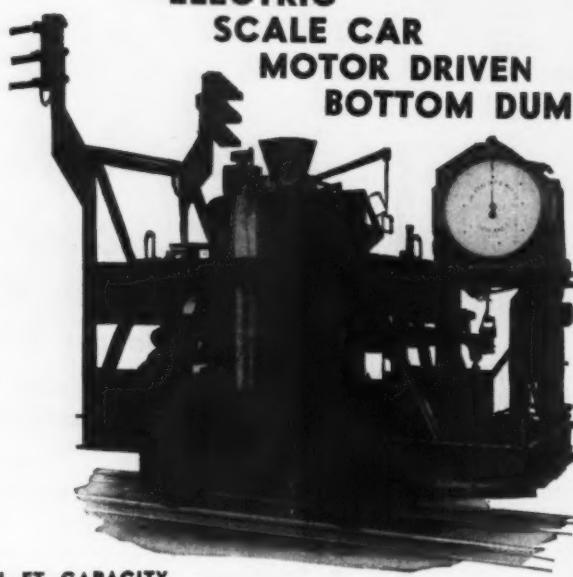
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**10 TON STORAGE BATTERY FLAT CAR**



Built for handling pipe and conduit. Powered by storage battery. Geared to travel at walking speed when controller is held in operating position. Automatic "shut-off" and brake applied when spring return handle of the controller is released.

**ELECTRIC  
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**36 CU. FT. CAPACITY**

For use in chemical plants. Cylindrical type body with dust filter. Mounted on Atlas Scale with 24" Atlas Dial and type-printing recorder. Car equipped with brakes, levers for operating discharge and loading chutes.

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**NEW PRODUCTION IDEAS**

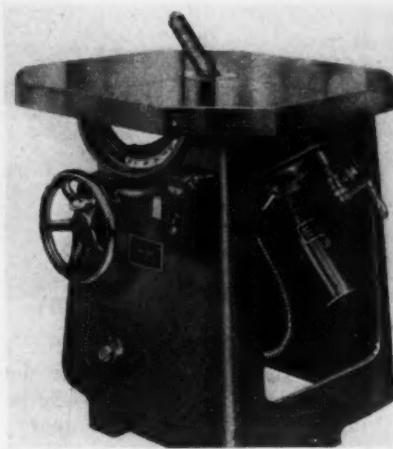
*Continued*

sists of an air-core coil built in a frame that can be mounted on table or bench. The coil is rated at 115 v, 60 cycles and is equipped with switch, pilot lamp, and a flexible lead fitted with a standard plug. A rectangular opening 4 1/2 x 8 1/2 in. accommodates stock up to 8 in. wide. *General Electric Co.*  
For more data insert No. 32 on postcard, p. 37.

**Spindle Sander**

Spindle oscillates 1 1/2 in. with 56 strokes per min at 1800 rpm.

Of interest to foundries for use in their pattern shops, the No. 381-D heavy duty oscillating spindle sander has an extra large cast iron base with 18-in. diam



rockers and 37x37-in. table with removable cast iron throat plates for 2 and 4-in. drums. Power is supplied by a 1 hp, 1800 rpm, totally enclosed fan cooled motor for 3 phase, 60 cycle, 220 or 440 v. Motor and spindle tilt 45° forward and 5° back from vertical position. A 3-in. vertical adjustment of the spindle unit and inverting sanding sleeve provides full use of the drum sanding area. *Oliver Machinery Co.*  
For more data insert No. 33 on postcard, p. 37.

**Grease Testing Machine**

Analyzes performance of greases in ball and roller bearings.

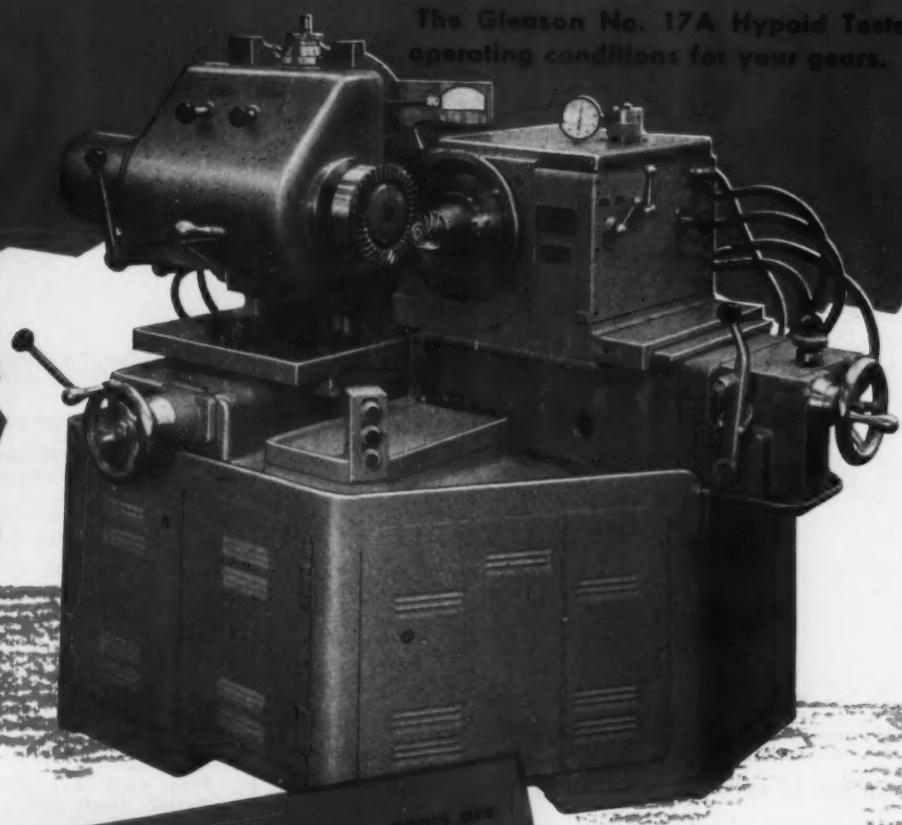
By observing grease samples in the grease testing machine during test and under high speed stroboscopic light, it is possible to determine changes in quality, texture, consistency and color. In

*(Turn to Page 134)*

# QUALITY CONTROL

## FOR YOUR BEVEL GEAR MANUFACTURE

The Gleason No. 17A Hypoid Tester provides actual operating conditions for your gears.



**No. 17-A  
HYPOID  
TESTER**

Just cutting bevel gears is not enough... gears are used in units where uninterrupted operation is essential. They have to operate under extreme load conditions with accurate transmission of power. Just how these gears are being cut, the uniformity with which they are being manufactured and how they will best operate when assembled can be easily determined. For the No. 17A Hypoid Tester can be simply set up and a constant check can easily be made to guarantee top quality results... Results, for longer lasting smoother operating bevel gears.

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**BEFORE PRODUCTION**—to establish the correct setup for the gear cutting machine.

**DURING PRODUCTION**—to maintain uniform quality of the cut gears.

**FINAL TEST**—to find the best running quality of the gears for assembly... eliminating costly fitting or tearing down and rebuilding of assemblies.

**Builders of Bevel Gear Machinery for Over 85 Years**

**FOR** **E**lectrocleaning

Wyandotte F.S.\* Cleaner, a heavy-duty electrocleaner, is particularly recommended for cleaning ferrous parts.

F.S. is designed to remove fabricating compounds and fabricating smut before electroplating.

A well-balanced formula insures: fast, thorough wetting and cleaning action; controlled foaming; high soil-suspension ability; long life in solution. The high alkalinity of Wyandotte F.S. insures high conductivity and effective "scrubbing" action.

For complete details, write us today.

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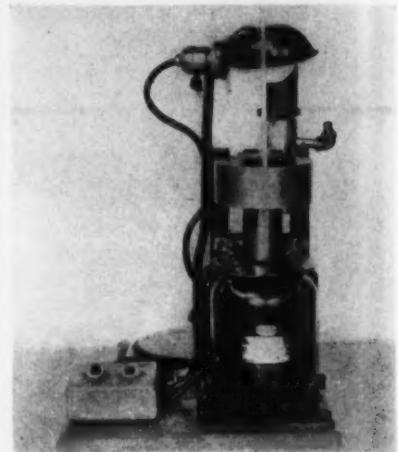
## SERVICE REPRESENTATIVES IN 88 CITIES



# Wyandotte

REG. U. S. PAT. OFF.

simulating actual service conditions, the machine also reveals grease tendencies toward aeration, leakage and breakdown through heat and prolonged use. A high speed motor-driven shaft operates a single-shielded ball bearing encased in an electrically heated oil

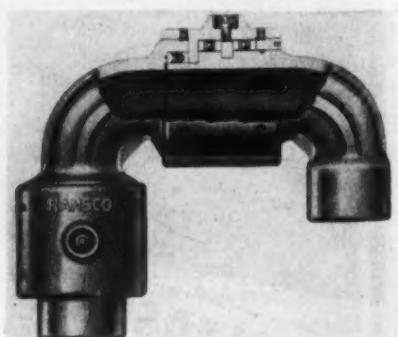


bath. Test procedure starts with a charge of 5 grams of test grease to the bearing. The greased bearing is put into the machine and the test is run for 3 min before the heater is turned on. Observation of the grease sample is made at 25° increments while the machine is running at 3450 rpm. *Texas Co.* For more data insert No. 34 on postcard, p. 37.

## Swivel Fittings

Free, easy 360° rotation; single, double, triple swing combinations.

Ball bearing swivel fittings for 360° rotation under pressure are made in three types: High pres-



sure, up to 15,000 psi at 225°F for pressure or vacuum lines; low pressure, up to 1000 psi at 225°F; high temperature-corrosive service, up to 1000 psi at 750°F, for steam.

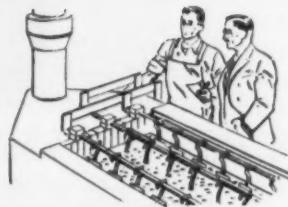
News about

UNICHROME

Trade Mark

## COATINGS for METALS

METALLIC • ORGANIC  
DECORATIVE • PROTECTIVE



### What! HIGH SPEED chromium plating?

The most important advance in chromium plating in 20 years, Unichrome S.R.H.S. Chromium plates faster than conventional solutions — in some cases cutting time in half. It also plates bright over a wider current range — assuring less "burning" and "missing" on irregular parts. Its self-regulation insures a more foolproof bath with less supervision.



### Enduring rack protection in all plating baths

A green plastisol baking coating, Unichrome Coating 218X withstands severest plating cycles, including vapor degreasing. It does not contaminate plating baths. Uses a single prime coat. Technical help on application technique provided to assure longest-lasting job.



### For a zinc finish that stays bright

Because it gives zinc plate a brilliant lustre, protects it from corrosion, and costs so little, Unichrome Dip Finish is being used extensively on refrigerator shelves today...as well as on other wire goods, die castings, screws, nuts, bolts.

UNITED CHROMIUM, INCORPORATED

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hot oil or asphalt, liquified gases, sulfuric acids and many other acids and caustics. Swivel fittings can be adapted to piping situations that require a flexible steel swing line. Sizes range from  $\frac{3}{8}$  to 14 in. on low pressure fittings; 2, 2 $\frac{1}{2}$ , 3, and 4 in. internal pipe thread on gear driven types. *Rasmussen Mfg. Co.*

For more data insert No. 35 on postcard, p. 37.

### Vapor Collector

High volume, self-contained;  
reduces maintenance, fire-hazard.

Developing 3600 cfm at 5-in. water lift through an 8-in. inlet with its 5 hp motor, the Model VC-5 vapor collector is said to have ample capacity for collecting large



volumes of mist and vapor from screw machines, centerless grinders, chucking machines, etc. The machine is equipped complete with motor mounted starting switch and drain spout for returning collected condensate to reservoir of machine or to waste as desired. Vapor mist is condensed by a special non-inflammable spun-glass filter. The VC-5 can be mounted overhead. *Aget-Detroit Co.*

For more data insert No. 36 on postcard, p. 37.

### Aluminum Hoppers

Feeds cylindrical workpieces;  
features built-in gear reducer.

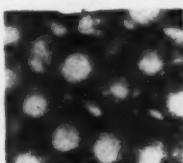
Four standard sizes of rotary-type cast aluminum hoppers have been added to the Kraus line of tumble hoppers. Sizes are 8, 12, 16 and 24 in. diam. These motor-

## Here's Why TRU-STEEL SHOT Costs Less to Use

### LIFE COMPARISON

TRU-STEEL vs. CHILLED IRON SHOT

Magnified 10X



TRU-STEEL

After 1500 Passes



CHILLED IRON

After 50 Passes

### Users Find TRU-STEEL Has 5 Important Advantages

- LASTS MANY TIMES LONGER—LESS SHOT IS USED  
Gray Forgings and Stamping Ltd.: "We find Tru-Steel Shot lasts from 5 to 6 times as long as ordinary shot."
- REDUCES CLEANING COSTS PER TON  
A Detroit Manufacturer: "Just figuring the savings in abrasive and parts alone, we showed a savings of 30% in the cost per ton of parts cleaned compared to our previous costs with chilled iron shot."
- SAVES STORAGE AND TRANSPORTATION COSTS  
A Prominent User: "In general Tru-Steel costs half as much as ordinary shot, cuts down on maintenance and costly parts with less handling and storage."
- INCREASES LIFE OF MACHINE PARTS  
A Midwest Manufacturer: "Another big advantage we find is the longer life of the machine itself. We saved 63% in the cost of replacement parts, not counting the time saved by our maintenance men in not having to replace parts often."
- REDUCES MACHINE MAINTENANCE COSTS  
A steel foundry reports the use of Tru-Steel shot resulted in a savings of 73% on wearables, 63% on abrasive consumption, and 80% on maintenance labor.

Write for Bulletin No. 59

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Mfd. by: Steel Shot Producers, Inc.

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ANY TYPE  
MATERIAL



Many Towmotor Fork Lift Trucks feature specially designed accessories **engineered for the job**—such as this revolving inverter device to "stir up" entire pallet loads of canned milk. There are many other Towmotor "firsts" developed to speed up every type of **Mass Handling** job . . . cut production time and costs . . . increase productive output. For more information, write for a copy of "Materials Handling Illustrated." Towmotor Corporation, Division 15, 1226 E. 152nd St., Cleveland 10, Ohio. Representatives in all Principal Cities in U. S. and Canada.



Ask to see  
the new Towmotor movie, "The One Man Gang," in your office

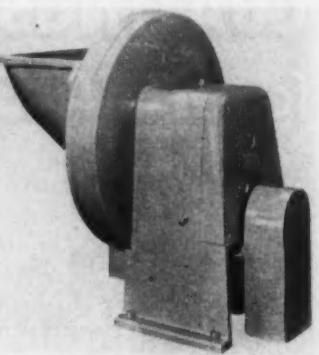


RECEIVING • PROCESSING • STORAGE • DISTRIBUTION

## NEW PRODUCTION IDEAS

*Continued*

driven units have a built-in gear reducer that is arranged to give variable speed to the rotor. This type hopper is said to be particu-



larly adapted to the feeding and orienting of most cylindrical work-pieces. Hoppers are individually designed to handle specific work-pieces. *Kraus Design, Inc.*

For more data insert No. 37 on postcard, p. 37.

### Automatic Drill Head

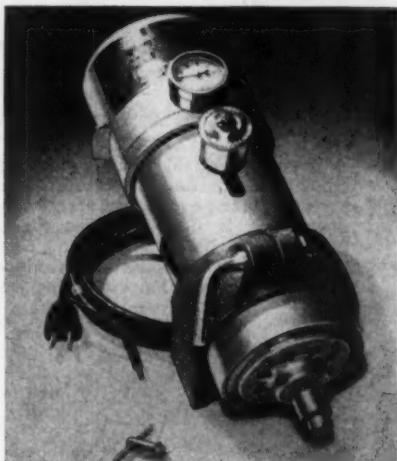
Unit drills 0.0135 to 0.1800-in. diam holes at 2500 to 7500 rpm.

Diameters from 0.0135 to 0.1800 in. in ferrous or non-ferrous metals, plastic, or wood can be drilled with this new automatic drill head. A No.



### WHAT IS YOUR PROBLEM?

Whether it is milk or machinery, Towmotor engineers have the experience background to solve your materials handling problem. Take advantage of this creative service for any industry, any plant—large or small.



0 precision Jacobs chuck is mounted on one end of the double-end armature shaft and a rotary vane compressor on the other. Motor supplies the power for drilling while self-contained air compressor advances drill at predetermined speed and pressure. This unit operates at work speeds varying from 2500 to 7500 rpm and at depth stroke ranges from 1/32 to 1 1/8 in. For-

### FORK LIFT TRUCKS and TRACTORS

nued

gear  
give  
This  
particu-

## AJAX-NORTHRUP MELTING HITS COMPOSITION

# "Right on the Nose"

And every heat of today's high-performance alloys must be checked out "right on the nose." The slightest oxidation or contamination means rejected castings—or loss of time and alloying constituents trying to bring the melt up to par.

That's why more and more foundries, alloy steel plants, and precision casting shops are turning to Ajax-Northrup melting as the only practical, economical way.

Ajax-Northrup high frequency furnaces stir as they melt—electrically. There's no carbon to contaminate the charge. One user holds carbon content within two one-hundredths of one per cent. It's so fast there's no oxidation. Savings in constituents and deoxidizers alone give Ajax-Northrup furnaces a two-to-one cost advantage in a nickel-steel plant. Melts fast or slow, or holds steady temperature. Easy to charge, requires little attention while melting.

### 33 YEARS OF EXPERIENCE

By combining the right work-proven Ajax-Northrup units with the right controls, we can tailor high frequency melting to your requirements. Motor-generator power from 25 to 1200 kw. and up. Self-tuning, trouble-free spark-gap converters from 3 to 40 kw. Furnaces from one ounce to a ton for all non-ferrous, and precious metals—to 8 tons for ferrous metals. Just name your alloys and quantities—we'll send you the proper technical bulletins—free.

## AJAX ELECTROTHERMIC CORPORATION

AJAX PARK, TRENTON 5, N. J.



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**AJAX**  
NORTHRUP  
HEATING & MELTING



117

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## NEW PRODUCTION IDEAS

Continued

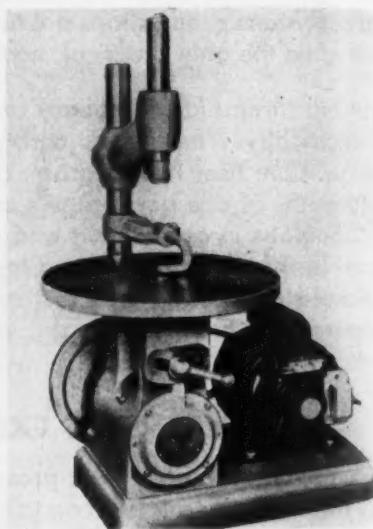
ward movement of drill is slowed at breakthrough point by increasing pressure of spring return. This prevents drill from breaking through and minimizes drill breakage and heavy burring. *Dumore Co.*

(For more data insert No. 38 on postcard, p. 37.)

### Die Filing Machine

Files intricate die contours at 375 to 500 strokes per min.

An improved model of the Illinois die filing machine incorporates modifications that increase



ease of operation, affect the chucking arrangement for files, saws and stone, and improve the lubrication system. The machine operates on 110 v, 60 cycle ac. Standard operating speed is 375 to 500 strokes; special alterations permit 250 or 650 strokes per min. *Illinois Tool Works.*

(For more data insert No. 39 on postcard, p. 37.)

### Panel Engraver

Engraves letters and numbers on metal, plastic or wood surfaces.

A pantograph engraving instrument designed for marking and engraving control panels and other large assemblies produces fine engraved letters, numbers or designs on metal, plastic or wood surfaces by tracing a master copy. Panels  $\frac{3}{8}$  in. thick x 19 in. wide and any length may be engraved. *Green Instrument Co.*

(For more data insert No. 40 on postcard, p. 37.)  
*Resume Your Reading on Page 41*



# MARKET

IRON AGE  
FOUNDED 1855  
MARKETS & PRICES

## Briefs and Bulletins

**war orders**—While material shortages get the headlines, Detroit's bottleneck will be a skilled manpower shortage. Tool and die shops have been crying for help for a month and haven't enough orders to fill a thimble. A few gages are about all that have come to light, although there are believed to be more than have been revealed. Known war orders include: Lear Mfg. Co., \$5,783,000 for automatic pilots and aviation parts; Great Lakes Steel, \$25,664 for "northern huts"; Beichold Chemicals, \$208,771 and U. S. Rubber, \$228,387 for aircraft castings.

**plate prices**—Lukens Steel Co., Coatesville, Pa., has raised the prices of carbon steel plates \$6.00 a ton to \$78.00 and alloy plates to \$96, also a \$6.00 boost. Light gage thickness extras were increased at the same time by \$4.00 a ton. Central Iron & Steel Co., Harrisburg, increased its price of carbon steel plates to \$85.00 per ton effective Aug. 14. Higher costs of scrap and pig iron were the causes of the advances, said the firm.

**some help**—Four Detroit window fabricators last week purchased European steel at a price reported below the U. S. mill price. The steel is believed to be Bessemer and the quality may not be too high. But the price, if correct, is quite a surprise. Foreign steel hasn't made much headway with the major companies, but is doing better with the growing number of steel-starved parts vendors.

**carryover**—It looks as if there will be a considerable tonnage carryover on plates and shapes into the fourth quarter. One company says it will take a month to clear them up and another says it will take 2 months.

**structurals advance**—Phoenix Iron & Steel Co., Phoenixville, Pa., has increased its f.o.b. mill base price on structural shapes from \$69.00 to \$85.00 a ton, effective Aug. 14.

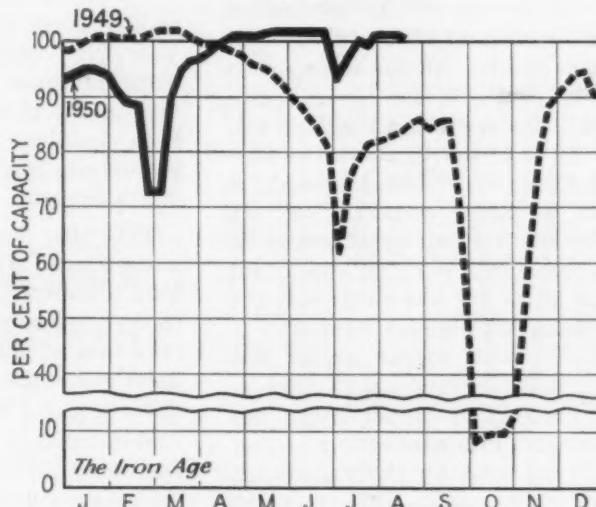
**buying nickel scrap**—Buyers of nickel for plating are now actively buying nickel scrap for conversion to anodes. They are reported to be paying 55c a pound and better.

**revised capacity**—New steelmaking capacity is being added so fast that official figures had to be revised at mid-year. As of July 1, 1950, the steel capacity of the U. S. was 100,563,500 net tons—an increase of 1,170,700 net tons over the first of the year's 99,392,800 net tons. Beginning this week, the new and higher capacity is being used by THE IRON AGE to calculate operating rates shown on this page. Operating rates from July 1, 1950 to date have been revised as follows: July 2, 92.0 pct; July 9, 95.5 pct; July 16, 99.0 pct; July 23, 98.5 pct; July 30, 100.0 pct; and Aug 6, 100.0 pct.

**prices going up**—Prices of foreign pig iron are on the way up. Swedish iron is being offered at \$45 c.i.f. eastern ports. Shortages are growing in foreign iron being offered to the U. S. market. Foreign producers are finding difficulty in meeting delivery commitments.

**end run**—Several purchasing agents have tried dropping their war truck orders in the hands of a new steel supplier. This end-run tactic has not been successful. However, the job of deciding what is and what is not a war project is increasing with every passing day.

### Steel Operations\*\*



### District Operating Rates—Per Cent of Capacity\*\*

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
Aug. 6	99.0*	102.0	92.0	90.0	99.5	104.0	102.0	104.0	105.0*	107.5	84.5	90.0	108.5	100.0*
Aug. 13	99.0	102.0	92.5	92.0	99.5	102.0	101.0	104.0	100.0	101.0	84.5	90.0	108.0	100.5

\* Revised.

\*\* Steel operations for the first half of 1950 are based on annual capacity of 99,392,800 net tons. Beginning July 1, 1950, operations are based on new annual capacity of 100,563,500 net tons.

# Nonferrous Metals Outlook

## Market Activities

**Conversion buying builds up scrap prices . . . Severe shortages in lead point to price rise . . . Tin reaches \$1.06 . . .**

**Copper deliveries drop sharply**



by JOHN ANTHONY

**New York**—The conversion deal is the dominant factor in today's metal markets, having an effect out of all proportion to the tonnages involved. The consumer buys scrap, usually paying a fancy price for it, and has it converted into metal on a toll basis. This type of transaction is developing rapidly, spurred on by shortages of most metals.

### Copper Costs 39¢

The growth of the conversion deal is robbing the refineries and ingot makers of the scrap normally available for their operations. Dealers who are able to sell for 3¢ to 4¢ per lb above the buying prices of meltters limited by a firm primary metal price are naturally holding up offerings. So the consumer pays an exorbitant total price for his metal and the open market tonnage falls off.

Last week copper scrap was bought for conversion as high as 23¢ per lb. One copper buyer who fabricates into wire estimates that his total cost on the conversion will be 39¢ per lb. This compares

with the current domestic market of 22½¢.

Scrap lead was being bought last week at 11½¢ and 11½¢ per lb. Conversion costs will raise the price of lead in these transactions to at least several cents per lb above the 12¢ lead market.

The lead shortage has gotten so bad in the last few weeks that the acute zinc situation seems mild by comparison. Smelters are unable to get any scrap, and secondary is selling above the primary market. There is every possibility of a price increase in lead within a very short time. Producers have been holding down an upward movement, deferring to the President's request.

The zinc market has settled down into an extremely tight situation. Producers have had to cut their customers back in order to take care of the new stockpile requirements for metal. The Joplin ore price of \$99 a ton for 60 pct concentrates is holding unchanged. There is little indication as yet for higher zinc prices in the offing.

At 15¢, zinc producers are reported to be able to meet current costs.

Deliveries of refined copper to fabricators in July dropped to 95,983 tons, about 30,000 tons less than the record tonnage in June. Sales for shipment in July were 112,500 tons, plus a carryover of 2500 tons. The difference is due in part to stocks held in bonded warehouse and the balance due to inability to deliver.

### Copper Output Down

Refined copper production declined to 96,734 tons in July, according to the Copper Institute, a drop of approximately 17,000 tons. Scrap recovery amounted to only 8675 tons, accounting for about 9000 tons of the drop in refined production. Stocks of refined copper at the end of July were only 48,266 tons.

Last week the tin market passed the all-time peak of \$1.03 per lb. The rise was very rapid, reaching \$1.06 early this week on heavy buying in Singapore. The British Ministry of Supply has put into effect a new policy of withholding its metal from the London Metal Exchange. If this policy is continued stocks of about 26,000 tons will be withheld from the market and the Exchange will become a small factor in the tin market. This development accounts for the heavy scare buying of tin.

### NONFERROUS METALS PRICES

	Aug. 9	Aug. 10	Aug. 11	Aug. 12	Aug. 14	Aug. 15
Copper, electro, Conn. ....	22.50	22.50	22.50	22.50	22.50	22.50
Copper, Lake, delivered ...	22.625	22.625	22.625	22.625	22.625	22.625
Tin, Straits, New York ....	\$1.01½	\$1.03	\$1.05	....	\$1.06	\$1.08*
Zinc, East St. Louis .....	15.00	15.00	15.00	15.00	15.00	15.00
Lead, St. Louis .....	11.80	11.80	11.80	11.80	11.80	11.80

Note: Quotations are going prices.

\*Tentative.

## MILL PRODUCTS

### Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 27.4¢; 4S, 61S-O, 29.8¢; 52S, 31.4¢; 24S-O, 24S-OAL, 30.3¢; 75S-O, 75S-OAL, 36.8¢; 0.081 in., 2S, 3S, 28.4¢; 4S, 61S-O, 30.7¢; 52S, 32.8¢; 24S-O, 24S-OAL, 31.4¢; 75S-O, 75S-OAL, 38.5¢; 0.032 in., 2S, 3S, 30.0¢; 4S, 61S-O, 34.0¢; 52S, 36.7¢; 24S-O, 24S-OAL, 38.4¢; 75S-O, 75S-OAL, 45.1¢.

Plate: 1/4 in., and heavier: 2S, 3S, F, 24.8¢; 4S, 27¢; 52S-F, 28.1¢; 61S-O, 27.6¢; 24S-F, 24S-FAL, 28.1¢; 75S-F, 75S-FAL, 34.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 33.6¢ to 67¢; 11 to 18, 34.3¢ to 79¢; 23 to 25, 36.5¢ to \$1.08; 35 to 37, 43.8¢ to \$1.66.

Red Rolled: 1.5 to 4.5 in., 2S-F, 38-F, 34.5¢ to 31¢; Cold-finished, 0.375 to 3 in., 2S, 3S, 27¢ to 32.5¢.

Screw Machine Stock: Rounds, 11S-T8, R317-T4, 1/8 to 11/32 in., 49.5¢ to 38.5¢; 1/4 to 1 1/4 in., 88¢ to 86¢; 1 1/2 to 3 in., 36¢ to 35¢; 17S-T4 lower by 1¢ per lb. Base 5000 lb.

Drawn Wire: Coiled, 0.061 to 0.274 in.; 2S, 36.5¢ to 27¢; 52S, 44.5¢ to 32.5¢; 56S, 47.5¢ to 39¢; 17S-T4, 50.5¢ to 35¢; 61S-T4, 45¢ to 34.5¢; 75S-T4, 76.5¢ to 55.5¢.

Extruded Tubing, Rounds: 63S-T5; OD in in.: 1 1/4 to 2, 33.5¢ to 49¢; 2 to 4, 30.5¢ to 41.8¢; 4 to 6, 31¢ to 37.8¢; 6 to 9, 31.5¢ to 39.5¢.

Roofing Sheet, Flat: 0.019 in. x 28 in. per sheet, 72 in., \$1.00¢; 96 in., \$1.34¢; 120 in., \$1.67¢; 144 in., \$2.01¢. Gage 0.024 in. x 28 in., 72 in., \$1.22¢; 96 in., \$1.63¢; 120 in., \$2.04¢; 144 in., \$2.45¢. Coiled Sheet: 0.019 in. x 28 in., 24.7¢ per lb; 0.024 in. x 28 in., 23.7¢ per lb.

### Magnesium

(Cents per lb, f.o.b. mill, freight allowed)

Sheet and Plate: M-O, FS-O, 1/4 in. 58¢ to 60¢; 3/16 in. 60¢ to 62¢; 1/8 in. 62¢ to 64¢; B & S gage 10, 63¢ to 65¢; 12, 67¢ to 69¢; 14, 73¢ to 78¢; 16, 80¢ to 86¢; 18, 88¢ to 93¢; 20, \$1.00 to \$1.05; 22, \$1.22-\$1.31; 24, \$1.62-\$1.75. Specification grade higher. Base: 30,000 lb.

Extruded Round Rod: M, FS, diam in., 1/4 in. to 0.311, 66¢; 1/2 in. to 1/4, 50¢; 1 1/4 to 1.749, 47¢; 2 1/2 to 5 in., 45¢. Other alloys higher. Base: Up to 1/4 in., diam, 10,000 lb; 5/8 in. to 1 1/4 in., 20,000 lb; 1 1/4 in. and larger, 30,000 lb.

Extruded Solid Shapes, Rectangles: M, FS, in weight per ft, for perimeters of less than size indicated, 0.10 to 0.11 lb per ft, per. up to 1.5 in., 59.5¢; 0.22 to 0.25 lb per ft, per. up to 5.9 in., 65¢; 0.50 to 0.59 lb per ft, per. up to 8.6 in., 50.5¢; 1.8 to 2.59 lb per ft, per. up to 19.5 in., 47.5¢ to 4 to 6 lb per ft, per. up to 28 in., 46.5¢. Other alloys higher. Base, in weight per ft of shape: Up to 1/2 in., 10,000 lb; 1/2 in. to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 30,000 lb.

Extruded Round Tubing: M, FS, wall thickness, outside diam, in., 0.049 to 0.057, 1/4 in. to 5/16, \$1.40¢; 5/16 to 3/4, \$1.26¢; 3/4 to 5/8; 1 to 2 in., 76¢; 0.165 to 0.219, 5/8 to 3/4, 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. Other alloys higher. Base, OD in. in: Up to 1 1/2 in., 10,000 lb; 1 1/2 in. to 3 in., 20,000 lb; 3 in. and larger, 30,000 lb.

### Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

"A" Nickel Monel  
Sheets, cold-rolled . . . . . 69 53  
Strip, cold-rolled . . . . . 75 56  
Rods and bars . . . . . 65 51  
Angles, hot-rolled . . . . . 65 51  
Plates . . . . . 67 52  
Seamless tubes . . . . . 98 86  
Shot and blocks . . . . . 46

### Copper, Brass, Bronze

(Cents per lb, freight prepaid on 200 lb)

	Sheets	Rods	Shapes
Copper . . . . .	37.43	33.28	37.03
Copper, h-r . . . . .	34.53	32.28	37.03
Copper, drawn . . . . .	35.52	35.21	33.58
Yellow brass . . . . .	34.19	33.58	34.22
Red brass . . . . .	35.96	35.65	34.22
Naval brass . . . . .	38.90	32.96	32.65
Leaded brass . . . . .	28.54	32.65	32.65
Com'l bronze . . . . .	36.93	36.62	37.85
Manganese bronze . . . . .	42.40	36.27	37.85
Phosphor bronze . . . . .	55.11	55.36	54.94
Muntz metal . . . . .	37.13	33.69	34.94
Everdur, Her-culoy, Olym-pic, etc. . . . .	42.05	40.99	—
Nickel silver 10 pct . . . . .	45.48	47.74	32.65
Arch. bronze . . . . .	—	—	—

## PRIMARY METALS

(Cents per lb, unless otherwise noted)

Aluminum ingot, 99+%, 10,000 lb, freight allowed . . . . .	17.50
Aluminum pig . . . . .	16.50
Antimony, American, Laredo, Tex. . . . .	24.50
Beryllium metal, 95% lumps, beads . . . . .	\$95.00
Beryllium copper, 3.75-4.25% Be, dollars per lb contained Be . . . . .	\$30.00
Beryllium aluminum 5% Be, dollars per lb contained Be . . . . .	\$65.00
Bismuth, ton lots . . . . .	\$2.00
Cadmium, del'd . . . . .	\$2.15
Cobalt, 97-99% (per lb) . . . . .	\$1.80 to \$1.87
Copper, electro, Conn. Valley . . . . .	22.50
Copper, Lake, delivered . . . . .	22.625
Gold, U. S. Treas., dollars per oz. . . . .	\$35.00
Indium, 99.8%, dollars per troy oz . . . . .	\$2.25
Iridium, dollars per troy oz . . . . .	\$160
Lead, St. Louis . . . . .	11.80
Lead, New York . . . . .	12.00
Magnesium, 99.8+%, f.o.b. Freeport Tex., 10,000 lb . . . . .	22.50
Magnesium, sticks, 100 to 500 lb . . . . .	39.00¢ to 41.00¢
Mercury, dollars per 76-lb flask f.o.b. New York . . . . .	\$79 to \$80
Nickel, electro, f.o.b. New York . . . . .	51.32
Nickel oxide sinter, f.o.b. Copper Cliff, Ont., contained nickel . . . . .	44.25
Palladium, dollars per troy oz . . . . .	\$24.00
Platinum, dollars per troy oz . . . . .	\$74 to \$77
Silver, New York, cents per oz. . . . .	72.75
Tin, New York . . . . .	\$1.08
Zinc, East St. Louis . . . . .	15.00
Zinc, New York . . . . .	15.72
Zirconium copper, 50 pct . . . . .	\$6.20

## REMETALLED METALS

### Brass Ingot

(Cents per lb delivered, carloads)

55-5-5-5 ingot	23.00
No. 115 . . . . .	22.50
No. 120 . . . . .	22.00
No. 123 . . . . .	27.00
80-10-10 ingot	24.50
No. 305 . . . . .	35.50
No. 315 . . . . .	32.50
88-10-2 ingot	27.00
No. 210 . . . . .	19.75
No. 215 . . . . .	25.50
No. 245 . . . . .	25.50
Yellow ingot	25.50
No. 405 . . . . .	25.50
Manganese bronze	25.50
No. 421 . . . . .	25.50

### Aluminum Ingot

(Cents per lb, 30,000 lb lots)

95-5 aluminum - silicon alloys	24.00-24.50
0.30 copper, max . . . . .	23.75-24.25
0.60 copper, max . . . . .	23.00-23.25
Piston alloys (No. 122 type)	22.50-22.75
No. 12 alum. (No. 2 grade)	22.75-23.00
108 alloy	23.00-23.50
195 alloy	24.00-24.50
13 alloy	24.50-24.75
AXS-679	23.25-23.50

### Steel deoxidizing aluminum, notch-bar granulated or shot

Grade 1—95-97 1/2% . . . . .	24.00-24.50
Grade 2—92-95% . . . . .	23.00-23.50
Grade 3—90-92% . . . . .	22.00-22.50
Grade 4—85-90% . . . . .	21.50-22.00

## ELECTROPLATING SUPPLIES

### Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	Cast, oval, 15 in. or longer . . . . .	33 1/2
	Electrodeposited . . . . .	33 1/2
	Rolled, oval, straight, delivered . . . . .	36.50
	Forged ball anodes . . . . .	41
Brass	80-20	34 1/2
	Cast, oval, 15 in. or longer . . . . .	34 1/2
	Zinc, oval . . . . .	23
	Ball anodes . . . . .	22
Nickel	99 pct plus	68.00
	Cast . . . . .	69.00
	Rolled, depolarized . . . . .	\$2.30
Cadmium	Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport Conn. . . . .	79 1/2

### Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum . . . . .	52.15
Copper sulfate, 99.5 crystals, bbl. . . . .	10%
Nickel salts, single or double, 4-100 lb bags, frit allowed . . . . .	20%
Nickel chloride, 375 lb drum . . . . .	27 1/2
Silver cyanide, 100 oz lots, per oz . . . . .	61 1/2
Sodium cyanide, 96 pct domestic 200 lb drums . . . . .	19.25
Zinc cyanide, 100 lb drums . . . . .	45.85

## SCRAP METALS

### Brass Mill Scrap

(Cents per pound; add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

Copper . . . . .	19 1/2	18 1/2
Yellow brass . . . . .	16 1/2	16
Red brass . . . . .	18 1/2	17 1/2
Commercial bronze . . . . .	18 1/2	17 1/2
Manganese bronze . . . . .	16 1/2	15 1/2
Leaded brass rod ends . . . . .	16 1/2	—

### Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire . . . . .	19.75
No. 2 copper wire . . . . .	18.75
Light copper . . . . .	17.75
No. 1 comp turnings . . . . .	16.50-16.75
No. 1 comp turnings . . . . .	14.50-14.75
Rolled brass . . . . .	15.75-16.00
Brass pipe . . . . .	14.00
Radiators . . . . .	13.50

### Dry copper content

### Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper wire . . . . .	19.75
No. 2 copper wire . . . . .	18.75
Light copper . . . . .	17.75
No. 1 composition . . . . .	17.00-17.25
No. 1 comp turnings . . . . .	16.50-16.75
Rolled brass . . . . .	14.50-14.75
Brass pipe . . . . .	13.75-14.00
Radiators . . . . .	13.00
Heavy yellow brass . . . . .	13.00
Aluminum . . . . .	14.00
Mixed old cast . . . . .	14.50
Mixed old clips . . . . .	13.00
Mixed turnings, dry . . . . .	14.00
Pots and pans . . . . .	15.25
Low copper . . . . .	15.25

### Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

Copper and Brass	18 1/2-19
No. 1 heavy copper and wire . . . . .	17 1/2-18
No. 2 heavy copper and wire . . . . .	16 1/2-17
Light copper . . . . .	16 1/2-17 1/2
Auto radiators (unsweated) . . . . .	12 1/2-13
No. 1 composition . . . . .	15-15 1/2
No. 1 composition turnings . . . . .	14 1/2-15
Clean red car boxes . . . . .	13 1/2-14
Cocks and faucets . . . . .	13 1/2-14
Mixed heavy yellow brass . . . . .	10 1/2-10 1/2
Old rolled brass . . . . .	11 1/2-12
Brass pipe . . . . .	13 1/2-14
New soft brass clippings . . . . .	14 1/2-15
Brass rod ends . . . . .	12 1/2-13
No. 1 brass rod turnings . . . . .	12 1/2-12 1/2

### Nickel and Monel

Pure nickel clippings . . . . .

Clean nickel turnings . . . . .	38
Nickel anodes . . . . .	38
Nickel rod ends . . . . .	38
New Monel Clippings . . . . .	17
Clean Monel turnings . . . . .	15
Old sheet Monel . . . . .	16
Inconel clippings . . . . .	22
Nickel silver clippings, mixed . . . . .	9
Nickel silver turnings, mixed . . . . .	6

### Lead

Soft scrap, lead . . . . .

Ball plates (dry) . . . . .	11
	—11 1/2
	5 1/2-5 3/4

### Magnesium

Segregated solids . . . . .

Castings . . . . .	9
	—10
	5 1/2-6 1/2

### Miscellaneous

Block tin . . . . .

No. 1 pewter . . . . .	73
	—75
No. 1 auto babbitt . . . . .	53
	—55
Mixed common babbitt . . . . .	46
	—48
Solder joints . . . . .	9 1/2-10
Siphon tops . . . . .	15 1/2-16
Small foundry type . . . . .	46
Monotype . . . . .	13-13 1/2
Lino. and stereotype . . . . .	12-12 1/2
Electrotype . . . . .	11-11 1/2
New type shell cuttings . . . . .	9 1/2-10
Hand picked type shells . . . . .	15-15 1/2
Lino. and stereo. dross . . . . .	6-6 1/2
Electro. dross . . . . .	4 1/2-4 1/2

Block tin . . . . .

No. 1 auto babbitt . . . . .	73
	—75
No. 1 auto babbitt . . . . .	53
	—55
Mixed common babbitt . . . . .	46
	—48
Solder joints . . . . .	9 1/2-10
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New type shell cuttings . . . . .	9 1/2-10
Hand picked type shells . . . . .	15-15 1/2
Lino. and stereo. dross . . . . .	6-6 1/2
Electro. dross . . . . .	

**MARKETS—PRICES—TRENDS**



# SCRAP

**Iron & Steel**

## Scrap Nears June Top as Mart Keeps Going

All centers except Boston, New York, Detroit, Pittsburgh, and Chicago were at or higher than the levels they showed early in June when the market for scrap set this year's records. And these are expected to go higher.

THE IRON AGE scrap steel composite this week shot up to \$40.25, only 67¢ below the high of \$40.92 posted on June 6.

There is some feeling among scrap circles that No. 1 heavy melting steel is headed for a \$50.00 per ton price. It is anticipated by these people that when scrap reaches that figure, the government will slap on price controls.

The mills are desperately trying to hold down this upward spiral but they don't seem to be having a lot of success. It is certain that they do not want pegged prices on scrap because finished steel prices would probably be fixed if Washington went that far.

Despite these soaring prices, there is not much scrap coming into the dealers' yards. This and the ever increasing conversion deals are the two main causes for the skyrocket-like scrap market.

PITTSBURGH—The market is very strong. No. 1 heavy melting was quotable at \$44.50 to \$45.00, an advance of \$1.00 on appraisal. A leading consumer conceded that a representative tonnage could not be had for less than \$45.00. Brokers are forced to pay higher prices to pry available scrap loose from dealers. Turnings were showing more strength, with machine shop turnings up \$1.00, and brokers asking \$37.00 for short turnings. A pickup in foundry business has sharpened competition for cast and low phos. Low phos was bringing as high as \$50.00, while No. 1 machinery cast and mixed yard cast sold for \$48.00 and \$44.00, respectively, up \$3.00 and \$4.00.

CHICAGO—Increasing conversion deals are having a buoyant effect on railroad specialty scrap prices here. Most items are moving up steadily with the exception of openhearth grades. Despite broker offerings at last mill prices they are having a hard time buying openhearth grades in sizable quantities. Dealers report a scarcity of good No. 1 heavy melting steel. Some quarters are looking for a \$40.00 market on No. 1 heavy melting steel when mills come into the market for dealer scrap.

PHILADELPHIA—The scrap market was up again last week on heavy conversion buying and covering by brokers. Openhearth grades advanced \$1.00 to \$2.00 a ton. Blast furnace was up \$2.00. Low phos grades were up \$2.00 to \$3.00. Rail specialties were up \$1.00; crop rails were up \$2.00. Rails are very hard to find. Malleable was up \$3.00, and machinery cast up \$1.00. Other cast grades were unchanged. New mill buying has not developed yet, and some factors feel that business could not be placed at current quotations.

NEW YORK—No. 1 heavy melting steel is up \$3.00 a ton here to a high of \$35.00. Turnings and borings are also up. And the undertone of the market is even stronger than the current prices would indicate. There is no new buying in quantity from the mills at press time and very little scrap is going into dealers' yards.

DETROIT—The market is quiet this week but its tone is firm. There has been comparatively little local mill buying and, with few exceptions, dealers continue to move scrap promptly out of their yards. Talk of price controls is subsiding but the possibility that such action will be taken later is still being given serious consideration. No price changes are being made this week pending future developments that would justify a price movement.

CLEVELAND—Based on sale of a representative tonnage to a major consumer, No. 1 heavy melting steel is quotable at \$46.00 in the Valley this week. This dovetails with a rumor last week that \$48.00 had been paid for a tonnage of railroad heavy melting steel. The market is very strong, and some of the confusion of the past 3 weeks has disappeared as a result of an all-out effort by some consumers to cover their requirements. Orders are being extended, and raiding has been reported, and in a last-ditch effort, mills may once again return to earmarking.

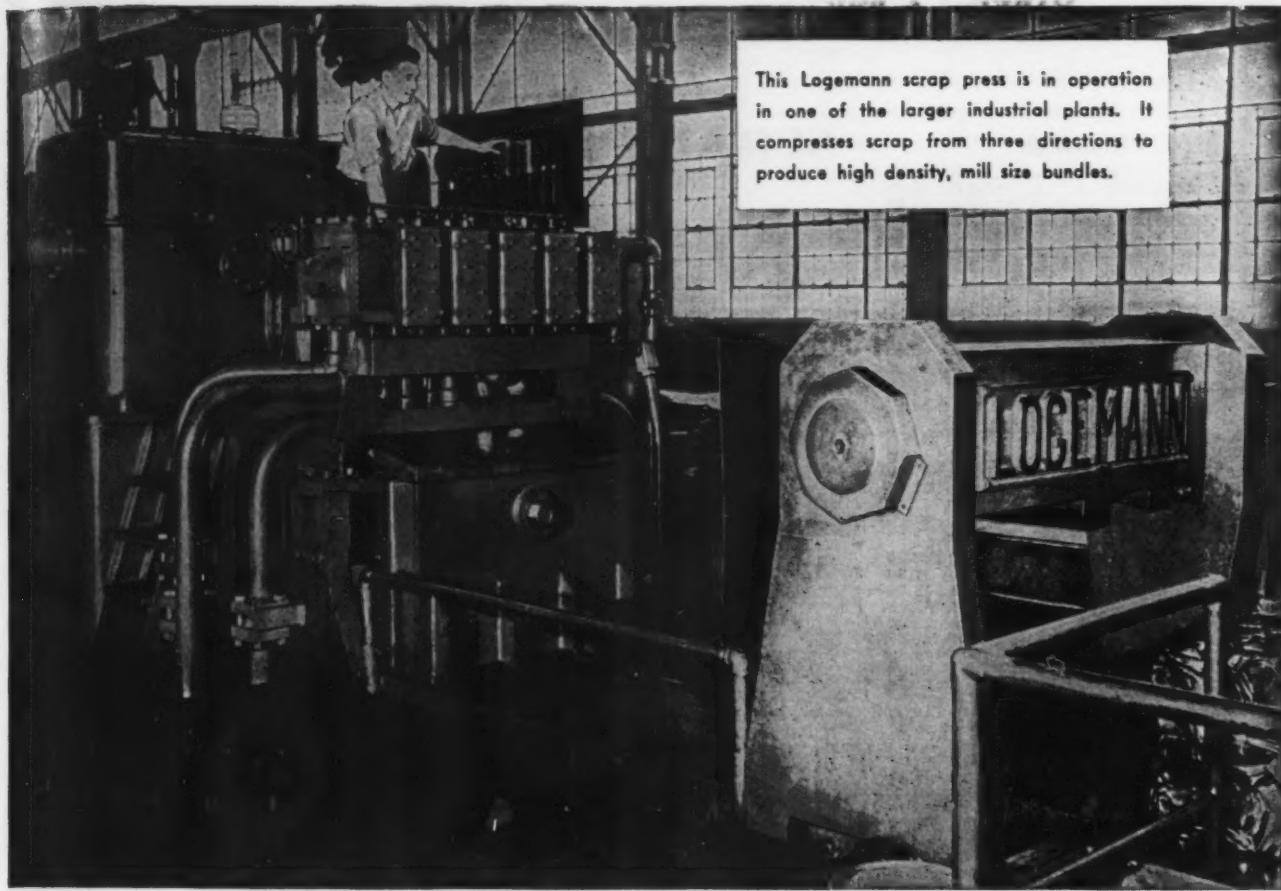
ST. LOUIS—To meet competition from Chicago, brokers have upped the price of No. 2 steel \$1.00 a ton although there is no buying by local mills. Demand for turnings from outside chemical companies and a short supply have caused a sharp advance. Chicago demand resulted in an increase of \$10.00 a ton for standard steel car axles.

CINCINNATI—A big demand for good openhearth tonnage has the market here as hot as a firecracker. Based on a sale of a representative tonnage late last week, No. 1 heavy melting steel is quotable here at \$39.50 to \$40.00. All district consumers are moving carefully in an effort to fill their requirements and keep tonnage from moving to other districts.

BOSTON—The market here has shown several rather sharp increases since last week. Most notable of these are \$4.00 increases for No. 1 steel, No. 1 bundles and No. 1 busheling, and a \$5.00 boost for mixed borings and turnings. Despite these jumps, brokers paradoxically say that there is not too much business.

BIRMINGHAM—Although the largest buyer of openhearth scrap has not changed its prices, the undertone of the market is very strong, particularly in specialties. No. 1 cupola cast remains strong at \$42.00, with some sold at \$42.50. Electric furnace grades are particularly strong because of a lack of No. 1 steel. One dealer sold a fairly large order of angles and splice bars at \$46.50.

BUFFALO—Price advances of \$2.50 to \$5.00 a ton were posted in scrap as pronounced strength dominated this market. Sales were reported to substantiate the sharpest gains in cast material. No. 1 machinery sold at \$41.50 to \$42.00, while cupola brought \$36.50 to \$37.00. Mills continue to cling to the sidelines in the market for ingot trade, but stiffer tendencies in outside markets are reflected in offerings here. No. 1 heavy melting is quoted at \$39.00 to \$40.00 while No. 2 is \$36.00 to \$37.00.



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**SCRAP PRESSES**

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**LOGEMANN BROTHERS COMPANY**  
 3164 W. Burleigh Street • Milwaukee 10, Wisconsin

## Pittsburgh

No. 1 hvy. melting	\$44.50 to \$45.00
No. 2 hvy. melting	36.50 to 37.00
No. 1 bundles	44.50 to 45.00
No. 2 bundles	35.50 to 36.00
Machine shop turn.	31.50 to 32.00
Mixed bor. and ms. turns.	31.50 to 32.00
Shoveling turnings	35.50 to 36.00
Cast iron borings	34.50 to 35.00
Low phos. plate	47.50 to 48.00
Heavy turnings	41.50 to 42.00
No. 1 RR. hvy. melting	46.00 to 46.50
Scrap rails, random lgth.	45.50 to 46.00
Rails 2 ft and under	48.00 to 49.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
RR. couplers and knuckles	47.00 to 48.00
No. 1 machinery cast	47.50 to 48.00
Mixed yard cast	43.50 to 44.00
Heavy breakable cast	36.50 to 37.00
Malleable	49.00 to 50.00

## Chicago

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 factory bundles	38.00 to 39.00
No. 1 dealers' bundles	38.00 to 39.00
No. 2 dealers' bundles	31.00 to 32.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	27.00 to 28.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	28.00 to 29.00
Low phos. forge crops	45.00 to 46.00
Low phos. plate	44.00 to 45.00
No. 1 RR. hvy. melting	42.00 to 43.00
Scrap rails, random lgth.	48.00 to 49.00
Rerolling rails	55.00 to 56.00
Rails 2 ft and under	54.00 to 55.00
Locomotive tires, cut	47.00 to 48.00
Cut bolsters & side frames	46.00 to 47.00
Angles and splice bars	52.00 to 53.00
RR. steel car axles	68.00 to 70.00
RR. couplers and knuckles	46.00 to 47.00
No. 1 machinery cast	49.00 to 50.00
No. 1 agricul. cast	47.00 to 48.00
Heavy breakable cast	39.00 to 40.00
RR. grate bars	38.00 to 39.00
Cast iron brake shoes	40.00 to 41.00
Cast iron car wheels	41.00 to 42.00
Malleable	51.00 to 52.00

## Philadelphia

No. 1 hvy. melting	\$37.00 to \$38.00
No. 2 hvy. melting	34.00 to 35.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	30.00 to 31.00
Machine shop turn.	26.00 to 27.00
Mixed bor. and turn.	24.00 to 25.00
Shoveling turnings	28.00 to 29.00
Low phos. punchings, plate	42.00 to 43.00
Low phos. 5 ft and under	42.00 to 43.00
Low phos. bundles	40.00 to 41.00
Hvy. axle forge turn.	37.00 to 38.00
Clean cast chem. borings	34.00 to 35.00
RR. steel wheels	43.00 to 44.00
RR. spring steel	43.00 to 44.00
Rails 18 in. and under	48.00 to 49.00
No. 1 machinery cast	41.00 to 42.00
Mixed yard cast	34.00 to 35.00
Heavy breakable cast	36.00 to 37.00
Cast iron carwheels	43.00 to 44.00
Malleable	48.00 to 49.00

## Cleveland

No. 1 hvy. melting	\$43.00 to \$43.50
No. 2 hvy. melting	35.50 to 36.00
No. 1 busheling	43.00 to 43.50
No. 1 bundles	43.00 to 43.50
No. 2 bundles	28.00 to 28.50
Machine shop turn.	30.00 to 30.50
Mixed bor. and turn.	32.00 to 33.50
Shoveling turnings	33.00 to 33.50
Cast iron borings	33.00 to 33.50
Low phos. 2 ft and under	44.00 to 44.50
Steel axle turn.	43.00 to 43.50
Drop forge flashings	43.00 to 43.50
No. 1 RR. hvy. melting	46.00 to 46.50
Rails 3 ft and under	51.00 to 52.00
Rails 18 in. and under	54.00 to 55.00
No. 1 machinery cast	49.00 to 50.00
RR. cast	49.00 to 50.00
RR. grate bars	37.00 to 38.00
Stove plate	41.00 to 42.00
Malleable	49.00 to 50.00

## Youngstown

No. 1 hvy. melting	\$45.50 to \$46.00
No. 2 hvy. melting	37.50 to 38.00
No. 1 bundles	45.50 to 46.00

## Iron and Steel

## SCRAP PRICES

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

No. 2 bundles	\$34.50 to \$35.00
Machine shop turn.	34.50 to 35.00
Shoveling turnings	36.50 to 37.00
Cast iron borings	36.50 to 37.00
Low phos. plate	46.50 to 47.00

## Buffalo

No. 1 hvy. melting	\$39.00 to \$40.00
No. 2 hvy. melting	36.00 to 37.00
No. 1 busheling	36.00 to 37.00
No. 1 bundles	37.00 to 38.00
No. 2 bundles	34.00 to 35.00
Machine shop turn.	30.00 to 31.00
Mixed bor. and turn.	30.00 to 31.00
Shoveling turnings	32.00 to 34.00
Cast iron borings	30.00 to 31.00
Low phos. plate	41.00 to 42.00
Scrap rails, random lgth.	44.00 to 45.00
Rails 2 ft and under	48.00 to 50.00
RR. steel wheels	47.00 to 48.00
RR. spring steel	47.00 to 48.00
RR. couplers and knuckles	47.00 to 48.00
No. 1 machinery cast	41.50 to 42.00
No. 1 cupola cast	36.50 to 37.00
Small Indus. malleable	37.00 to 38.00

## Birmingham

No. 1 hvy. melting	\$32.00 to \$33.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundles	26.00 to 27.00
No. 1 busheling	29.00 to 30.00
Machine shop turn.	25.00 to 26.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	24.00 to 25.00
Bar crops and plate	38.00 to 42.00
Structural and plate	38.00 to 42.00
Scrap rails, random lgth.	43.00 to 44.00
Rerolling rails	47.00 to 48.00
Rails 2 ft and under	47.50 to 48.50
Angles and splice bars	46.00 to 47.00
Std. steel axles	42.00 to 43.00
No. 1 cupola cast	41.00 to 42.00
Stove plate	35.00 to 36.00
Cast iron carwheels	33.00 to 34.00

## St. Louis

No. 1 hvy. melting	\$38.00 to \$39.00
No. 2 hvy. melting	33.00 to 34.00
No. 2 bundled sheets	32.00 to 33.00
Machine shop turn.	26.00 to 27.00
Shoveling turnings	27.00 to 28.00
Rails, random lengths	40.00 to 42.00
Rails 3 ft and under	45.00 to 46.00
Locomotive tires, uncut	42.00 to 43.00
Angles and splice bars	45.00 to 46.00
Std. steel car axles	65.00 to 66.00
RR. spring steel	44.00 to 45.00
No. 1 machinery cast	40.00 to 41.00
Hvy. breakable cast	35.00 to 36.00
Cast iron brake shoes	39.00 to 40.00
Stove plate	35.00 to 36.00
Cast iron car wheels	39.00 to 40.00
Malleable	45.00 to 46.00

## New York

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	27.00 to 28.00
No. 2 bundles	25.50 to 26.50
Machine shop turn.	22.50 to 23.00
Mixed bor. and turn.	22.50 to 23.00
Shoveling turnings	25.00 to 25.50
Clean cast chem. bor.	29.00 to 30.00
No. 1 machinery cast	31.50 to 32.50
Mixed yard cast	29.50 to 30.00
Charging box cast	29.50 to 30.00
Heavy breakable cast	30.00 to 30.50
Unstrp. motor blocks	22.50 to 23.00

## Boston

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$33.00 to \$34.00
No. 2 hvy. melting	25.00 to 26.00
No. 1 bundles	33.00 to 34.00

No. 2 bundles	\$25.00 to \$26.00
Machine shop turn.	22.00 to 22.50
Mixed bor. and turn.	22.00 to 23.00
Shoveling turnings	25.00 to 25.50
No. 1 busheling	32.00 to 33.00
Clean cast chem. borings	25.00 to 26.00
No. 1 machinery cast	33.00 to 34.00
Mixed cupola cast	29.00 to 30.00
Heavy breakable cast	28.00 to 29.00
Stove plate	28.00 to 29.00

## Detroit

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$34.00 to \$35.00
No. 2 hvy. melting	29.50 to 30.50
No. 1 bundles	38.00 to 39.00
New busheling	36.00 to 37.00
Flashings	35.50 to 36.00
Machine shop turn.	24.50 to 25.00
Mixed bor. and turn.	24.50 to 25.00
Shoveling turnings	29.00 to 30.00
Cast iron borings	29.00 to 30.00
Low phos. plate	37.00 to 38.00
No. 1 cupola cast	40.50 to 41.00
Heavy breakable cast	32.50 to 33.00
Stove plate	34.50 to 35.00
Automotive cast	44.00 to 45.00

## Cincinnati

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$39.50 to \$40.00
No. 2 hvy. melting	33.50 to 34.00
No. 1 bundles	39.50 to 40.00
No. 2 bundles, black	33.50 to 34.00
No. 2 bundles, mixed	26.50 to 27.00
Machine shop turn.	22.50 to 23.00
Mixed bor. and turn.	23.50 to 25.00
Shoveling turnings	25.50 to 26.00
Cast iron borings	25.50 to 26.00
Low phos. 18 in. under	49.00 to 50.00
Rails, random lengths	44.00 to 45.00
Rails, 18 in. and under	51.00 to 52.00
No. 1 cupola cast	48.00 to 49.00
Hvy. breakable cast	39.00 to 40.00
Drop broken cast	50.00 to 51.00

## San Francisco

F.o.b. shipping point:	
No. 1 hvy. melting	\$22.00
No. 2 hvy. melting	20.00
No. 1 bundles	22.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turn.	9.00
Elec. fur. 1 ft and under	32.50
No. 1 RR. hvy. melting	22.00
Scrap rails, random lgth.	22.00
No. 1 cupola cast	\$32.50 to 34.00

## Seattle

No. 1 hvy. melting	\$24.00

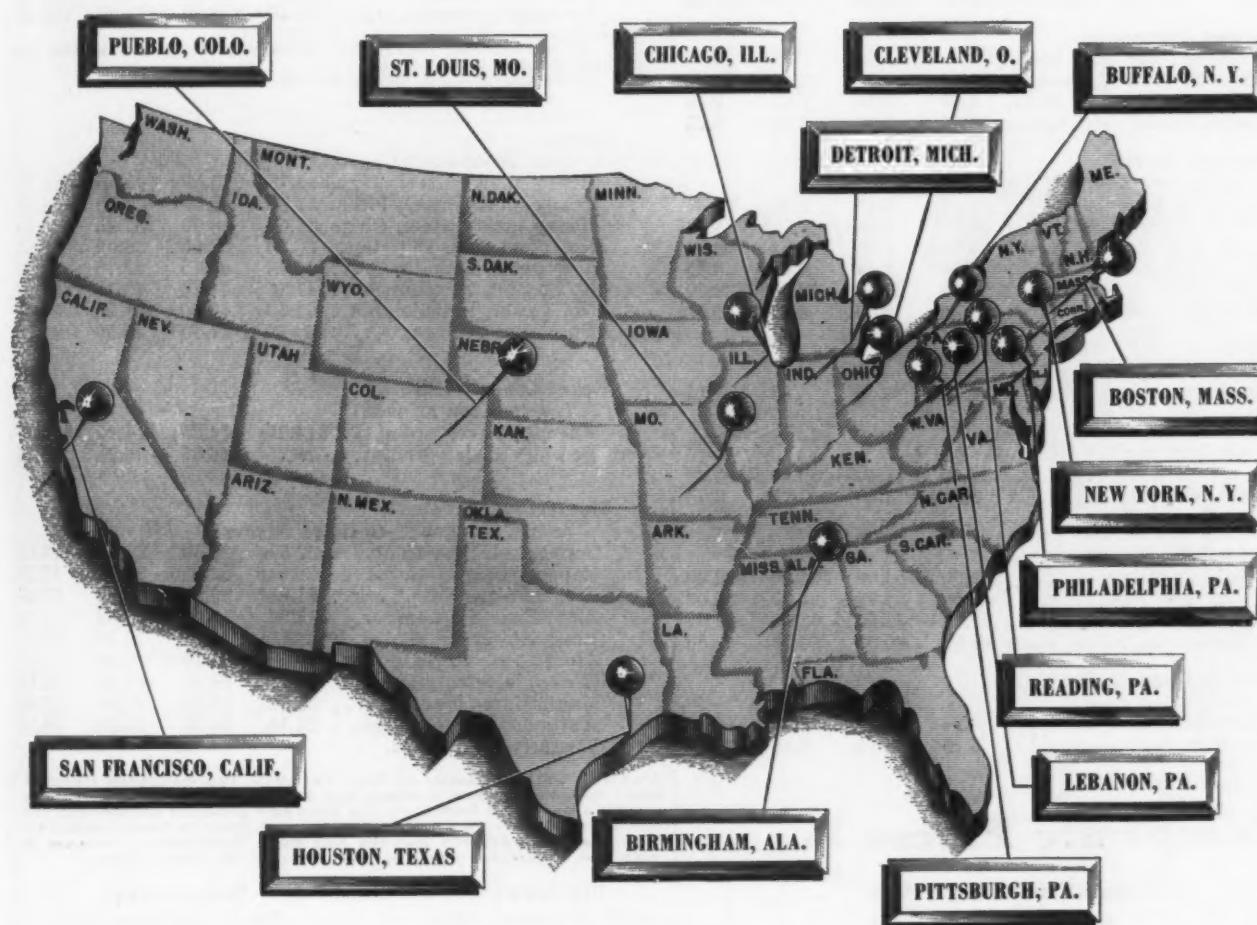


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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

## Comparison of Prices

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	Aug. 15	Aug. 8	July 18	Aug. 16
(cents per pound)	1950	1950	1950	1949
Hot-rolled sheets	3.35	3.35	3.35	3.25
Cold-rolled sheets	4.10	4.10	4.10	4.00
Galvanized sheets (10 ga)	4.40	4.40	4.40	4.40
Hot-rolled strip	3.25	3.25	3.25	3.25
Cold-rolled strip	4.21	4.21	4.21	4.038
Plate	3.50	3.50	3.50	3.40
Plates wrought iron	7.85	7.85	7.85	7.85
Stains C-R strip (No. 302)	33.00	33.00	33.00	33.25

## Tin and Terneplate:

(dollars per base box)	Aug. 15	Aug. 8	July 18	Aug. 16
Tinplate (1.50 lb) cokes	\$7.50	\$7.50	\$7.50	\$7.75
Tinplate, electro (0.50 lb)	6.60	6.60	6.60	6.70
Special coated mfg. terne	6.35	6.35	6.35	6.65

## Bars and Shapes:

(cents per pound)	Aug. 15	Aug. 8	July 18	Aug. 16
Merchant bars	3.45	3.45	3.45	3.35
Cold-finished bars	4.145	4.145	4.145	3.995
Alloy bars	3.95	3.95	3.95	3.75
Structural shapes	3.40	3.40	3.40	3.25
Stainless bars (No. 302)	28.50	28.50	28.50	28.50
Wrought iron bars	9.50	9.50	9.50	9.50

## Wire:

(cents per pound)	Aug. 15	Aug. 8	July 18	Aug. 16
Bright wire	4.50	4.50	4.50	4.15

## Rails:

(dollars per 100 lb)	Aug. 15	Aug. 8	July 18	Aug. 16
Heavy rails	\$3.40	\$3.40	\$3.40	\$3.20
Light rails	3.75	3.75	3.75	3.55

## Semifinished Steel:

(dollars per net ton)	Aug. 15	Aug. 8	July 18	Aug. 16
Rerolling billets	\$54.00	\$54.00	\$54.00	\$52.00
Slabs, rerolling	54.00	54.00	54.00	52.00
Forging billets	63.00	63.00	63.00	61.00
Alloy blooms, billets, slabs	66.00	66.00	66.00	63.00

## Wire Rod and Skelp:

(cents per pound)	Aug. 15	Aug. 8	July 18	Aug. 16
Wire rods	3.85	3.85	3.85	3.40
Skelp	3.15	3.15	3.15	3.25

Price advances over previous week are printed in Heavy Type; declines appear in Italic.

Pig Iron:	Aug. 15	Aug. 8	July 18	Aug. 16
(per gross ton)	1950	1950	1950	1949
No. 2, foundry, del'd Phila.	\$51.76	\$51.76	\$50.42	\$50.56
No. 2, Valley furnace	46.50	46.50	46.50	46.50
No. 2, Southern Cin'ti	49.08	49.08	49.08	45.47
No. 2, Birmingham	42.38	42.38	42.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	46.50
Basic del'd Philadelphia	50.92	50.92	49.92	49.74
Basic, Valley furnace	46.00	46.00	46.00	46.00
Malleable, Chicago†	46.50	46.50	46.50	46.50
Malleable, Valley	46.50	46.50	46.50	46.50
Charcoal, Chicago	68.56	68.56	68.56	73.78
Ferromanganese†	173.40	173.40	173.40	173.40

†The switching charge for delivery to foundries in the Chicago district is \$1 per ton.

†Average of U. S. prices quoted on Ferroalloy page.

## Scrap:

(per gross ton)	Aug. 15	Aug. 8	July 18	Aug. 16
Heavy melt'g steel, P'gh.	\$44.75	\$43.50	\$41.75	\$22.75
Heavy melt'g steel, Phila.	37.50	35.50	32.50	18.25
Heavy melt'g steel, Ch'go	38.50	38.50	37.25	22.50
No. 1 hy. com. sh't, Det.	38.50	38.50	36.00	16.50
Low phos. Young'n	46.75	45.75	42.75	24.75
No. 1 cast, Pittsburgh	47.75	44.75	43.75	34.50
No. 1 cast, Philadelphia	41.50	40.50	38.50	30.00
No. 1 cast, Chicago	49.50	47.50	45.50	40.50

## Coke: Connellsville:

(per net ton at oven)	Aug. 15	Aug. 8	July 18	Aug. 16
Furnace coke, prompt	\$14.25	\$14.25	\$14.25	\$14.25
Foundry coke, prompt	16.25	16.25	16.25	15.75

## Nonferrous Metals:

(cents per pound to large buyers)	Aug. 15	Aug. 8	July 18	Aug. 16
Copper, electro, Conn.	22.50	22.50	22.50	17.625
Copper, Lake, Conn.	22.625	22.625	22.625	17.75
Tin, Straits, New York	\$1.08*	99.25*	91.00	\$1.03
Zinc, East St. Louis	15.00	15.00	15.00	10.00
Lead, St. Louis	11.80	11.80	11.80	14.80
Aluminum, virgin	17.50	17.50	17.50	17.00
Nickel, electrolytic	51.22	51.22	51.22	42.93
Magnesium, ingot	22.50	22.50	21.50	20.50
Antimony, Laredo, Tex.	24.50	24.50	24.50	38.50

\*Tentative. \*Revised.

Starting with the issue of May 12, 1940, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the years 1937 to 1940 inclusive and 1948 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 139 of May 12, 1940, issue.)

## Pig Iron

Aug. 15	Aug. 8	July 18	Aug. 16
46.61 per gross ton	46.61 per gross ton	46.61 per gross ton	40.25 per gross ton
46.61 per gross ton	46.61 per gross ton	46.61 per gross ton	39.17 per gross ton
46.38 per gross ton	46.38 per gross ton	46.38 per gross ton	37.17 per gross ton
45.91 per gross ton	45.91 per gross ton	45.91 per gross ton	21.17 per gross ton

## Scrap Steel

Aug. 15	Aug. 8	July 18	Aug. 16
\$40.92 per gross ton	\$40.92 per gross ton	\$40.92 per gross ton	\$19.17 per gross ton
43.00 per gross ton	43.00 per gross ton	43.00 per gross ton	19.33 per gross ton
43.16 per gross ton	43.16 per gross ton	43.16 per gross ton	39.75 per gross ton
42.58 per gross ton	42.58 per gross ton	42.58 per gross ton	29.50 per gross ton
31.17 per gross ton	31.17 per gross ton	31.17 per gross ton	19.17 per gross ton
19.17 per gross ton	19.17 per gross ton	19.17 per gross ton	15.76 per gross ton
\$19.17 per gross ton	\$19.17 per gross ton	\$19.17 per gross ton	19.17 per gross ton

High	Low	High	Low
\$46.61 Aug. 8	\$45.88 Jan. 3	\$40.92 June 6	\$26.25 Jan. 3
46.87 Jan. 18	45.88 Sept. 6	43.00 Jan. 4	19.33 June 28
46.91 Oct. 12	39.58 Jan. 6	43.16 July 27	39.75 Mar. 9
37.98 Dec. 30	30.14 Jan. 7	42.58 Oct. 28	29.50 May 20
30.14 Dec. 10	25.37 Jan. 1	31.17 Dec. 24	19.17 Jan. 1
25.37 Oct. 23	23.61 Jan. 2	19.17 Dec. 24	15.76 Oct. 24
\$23.61	\$23.61	\$19.17	\$19.17
23.61	23.61	19.17	19.17
\$23.61	\$23.45 Jan. 2	\$22.00 Jan. 7	\$19.17 Apr. 10
23.45 Dec. 23	22.61 Jan. 2	21.83 Dec. 30	16.04 Apr. 9
22.61 Sept. 19	20.61 Sept. 12	22.50 Oct. 3	14.08 May 16
23.25 June 21	19.61 July 6	15.00 Nov. 22	11.00 June 7
32.25 Mar. 9	20.25 Feb. 16	21.92 Mar. 30	12.67 June 9
19.74 Nov. 24	18.73 Aug. 11	17.75 Dec. 21	12.67 June 8
18.84 Nov. 5	17.83 May 14	18.42 Dec. 10	10.83 Apr. 29
14.81 Jan. 5	13.56 Dec. 6	8.50 Jan. 12	6.43 July 5
18.71 May 14	18.21 Dec. 17	17.58 Jan. 29	14.08 Dec. 8

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

# SCRAP

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Sheet Iron for Baling  
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1950

IRON AGE

# STEEL PRICES

## INGOTS

Carbon forging, net ton

Alloy, net ton

## BILLETS, BLOOMS, SLABS

Carbon, rerolling, net ton

Carbon forging billets, net ton

Alloy, net ton

## PIPE SKELP

## WIRE RODS

## SHEETS

Hot-rolled (18 ga. &amp; hvr.)

Cold-rolled

Galvanized (10 gage)

Enameling (12 gage)

Long ternes (10 gage)

Hi Str. low alloy, h.r.

Hi str. low alloy, c.r.

Hi str. low alloy, galv.

## STRIP

Hot-Rolled

Cold-rolled

Hi str. low alloy, h.r.

Hi Str. low alloy, c.r.

## TINPLATE†

Cokes, 1.50-lb base box

1.25 lb, deduct 20¢

Electrolytic

0.25, 0.50, 0.75 lb box

## BLACKPLATE, 29 gage

Hollowware enameling

## BARS

Carbon steel

Reinforcing‡

Cold-finished

Alloy, hot-rolled

Alloy, cold-drawn

Hi str. low alloy, h.r.

## PLATE

Carbon steel

Floor Plates

Alloy

Hi Str. low alloy

SHAPES, Structural

Hi Str. low alloy

## MANUFACTURERS' WIRE

Bright

PILING, Steel Sheet

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.  
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

Pittsburgh	Chicago	Gary	Cleveland	Canion Massillon	Middle- town	Youngs- town	Bethle- hem	Buffalo	Consho- hocken	Johns- town	Spar- rows Point	Granite City	Detroit	
\$50.00 <sup>1</sup>													\$50.00 <sup>1</sup>	
\$51.00 <sup>1,17</sup>													\$51.00 <sup>1</sup>	
\$53.00 <sup>1</sup>	\$53.00 <sup>1</sup>	\$53.00 <sup>1</sup>				\$57.00 <sup>1,2</sup>		\$53.00 <sup>3</sup>	\$62.00 <sup>16</sup>	\$53.00 <sup>5</sup>				
\$63.00 <sup>1</sup>	\$63.00 <sup>1,4</sup>	\$63.00 <sup>1,8</sup>	\$63.00 <sup>4</sup>			\$63.00 <sup>2,5</sup>		\$63.00 <sup>3</sup>	\$68.00 <sup>26</sup>	\$63.00 <sup>3</sup>			\$63.00 <sup>31</sup>	
\$66.00 <sup>1,17</sup>	\$66.00 <sup>1,4</sup>	\$66.00 <sup>1</sup>		\$66.00 <sup>4</sup>		\$66.00 <sup>1,2</sup>	\$66.00 <sup>3</sup>	\$66.00 <sup>3</sup>	\$70.00 <sup>26</sup>	\$66.00 <sup>3</sup>			\$66.00 <sup>31</sup>	
3.15 <sup>1</sup>						3.15 <sup>1,4</sup>								
3.85 <sup>2,18</sup>	3.85 <sup>2,4,23</sup>	3.85 <sup>5</sup>	3.85 <sup>3</sup>			3.85 <sup>5</sup>				3.85 <sup>3</sup>	3.95 <sup>3</sup>			
3.35 <sup>1,5,9, 12</sup>	3.35 <sup>23</sup>	3.35 <sup>1,6,8</sup>	3.35 <sup>4, 8</sup>			3.35 <sup>1,4,6, 3,50<sup>13</sup></sup>		3.35 <sup>3</sup>	3.45 <sup>26</sup>	3.35 <sup>3</sup>		3.55 <sup>12</sup>	4.15 <sup>47</sup>	
4.10 <sup>1,8,7, 9,18</sup>		4.10 <sup>1,6,8</sup>	4.10 <sup>4, 18</sup>		4.10 <sup>7</sup>	4.10 <sup>4,6</sup>		4.10 <sup>3</sup>		4.10 <sup>3</sup>	4.30 <sup>23</sup>	4.30 <sup>12</sup>		
4.40 <sup>1,9,18</sup>		4.40 <sup>1,8</sup>		4.40 <sup>4</sup>		4.65 <sup>4</sup>	4.75 <sup>44</sup>			4.40 <sup>3</sup>				
4.40 <sup>1</sup>		4.40 <sup>1,8</sup>	4.40 <sup>4</sup>		4.40 <sup>7</sup>	4.40 <sup>6</sup>	4.90 <sup>76</sup>				4.80 <sup>23</sup>	4.70 <sup>12</sup>		
4.80 <sup>9,18</sup>		4.80 <sup>1</sup>			4.80 <sup>7</sup>	4.80 <sup>4</sup>								
5.05 <sup>1,8,9</sup>	5.05 <sup>1</sup>	5.05 <sup>1,6,8</sup>	5.05 <sup>4, 8</sup>			5.05 <sup>1,4,6, 12</sup>		5.05 <sup>3</sup>	5.05 <sup>26</sup>	5.05 <sup>3</sup>		5.25 <sup>12</sup>		
6.20 <sup>1,8,9</sup>		6.20 <sup>1,6,8</sup>	6.20 <sup>4, 8</sup>			6.20 <sup>4,6,12</sup>		6.20 <sup>3</sup>		6.20 <sup>8</sup>		6.40 <sup>12</sup>		
6.75 <sup>1</sup>										6.75 <sup>3</sup>				
3.25 <sup>5,7,9</sup>	3.25 <sup>3,66</sup>	3.25 <sup>1,6,8</sup>	3.25 <sup>5</sup>			3.25 <sup>1,4,6, 3,50<sup>13</sup></sup>		3.25 <sup>3</sup>	3.35 <sup>26</sup>	3.25 <sup>3</sup>		3.45 <sup>12</sup>	4.05 <sup>47</sup>	
4.15 <sup>5,7,9</sup>	4.30 <sup>8</sup>	4.30 <sup>8</sup>	4.15 <sup>2, 8</sup>		4.15 <sup>7</sup>	4.15 <sup>4,48, 49</sup>	4.50 <sup>13,40</sup>	4.15 <sup>3</sup>		4.15 <sup>3</sup>		4.35 <sup>12</sup>	4.75 <sup>48</sup>	4.95 <sup>47</sup>
4.95 <sup>9</sup>		4.95 <sup>1,6,8</sup>	4.95 <sup>5</sup>			4.95 <sup>1,4,6, 12</sup>		4.95 <sup>3</sup>	4.95 <sup>26</sup>	4.95 <sup>3</sup>		5.15 <sup>12</sup>		
6.20 <sup>9</sup>			6.20 <sup>2, 8</sup>			6.20 <sup>4,6,12</sup>		6.40 <sup>3</sup>		6.40 <sup>3</sup>		6.40 <sup>12</sup>		
\$7.50 <sup>1,8, 9,18</sup>		\$7.50 <sup>1,6, 8</sup>				\$7.50 <sup>4</sup>				\$7.80 <sup>3</sup>	\$7.70 <sup>23</sup>			

Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price

5.30 <sup>1,8,18</sup>		5.30 <sup>1,8</sup>				5.30 <sup>4</sup>					5.40 <sup>3</sup>	5.50 <sup>23</sup>	
3.45 <sup>1,8,9</sup>	3.45 <sup>1,6,23</sup>	3.45 <sup>1,6,8</sup>	3.45 <sup>4</sup>	3.45 <sup>4</sup>		3.45 <sup>1,4,6</sup>		3.45 <sup>3</sup>		3.45 <sup>3</sup>		3.65 <sup>12</sup>	
3.45 <sup>1,5</sup>	3.45 <sup>4</sup>	3.45 <sup>1,6,8</sup>	3.45 <sup>4</sup>			3.45 <sup>1,4,6</sup>		3.45 <sup>3</sup>		3.45 <sup>3</sup>	3.45 <sup>3</sup>		
4.10 <sup>5,6,17, 53,69,71</sup>	4.15 <sup>2,33, 69,70</sup>	4.16 <sup>4,73, 74</sup>	4.15 <sup>2, 61</sup>	4.15 <sup>4, 32-33</sup>		4.15 <sup>6,40,57</sup>		4.15 <sup>70</sup>				4.35 <sup>12</sup>	4.30 <sup>44</sup>
3.95 <sup>1,17</sup>	3.95 <sup>1,4,23</sup>	3.95 <sup>1,6,8</sup>		3.95 <sup>4</sup>		3.95 <sup>1,6,38</sup>	3.95 <sup>3</sup>	3.95 <sup>3</sup>		3.95 <sup>3</sup>		4.25 <sup>12</sup>	
4.90 <sup>2,17, 53,69,71</sup>	4.90 <sup>2,33, 69,70</sup>	4.90 <sup>4,73, 74</sup>	4.90 <sup>2, 61</sup>	4.90 <sup>4, 42-43</sup>		4.90 <sup>6,39,57</sup>	4.90 <sup>3</sup>	4.90 <sup>3</sup>	4.90 <sup>70</sup>			5.05 <sup>24</sup>	
5.20 <sup>1,5</sup>		5.20 <sup>1,6,8</sup>	5.20 <sup>4</sup>			5.20 <sup>1,6</sup>	5.20 <sup>3</sup>	5.20 <sup>3</sup>		5.20 <sup>3</sup>		5.40 <sup>12</sup>	
3.50 <sup>1,5</sup>	3.50 <sup>1</sup>	3.50 <sup>1,6,8</sup>	3.50 <sup>4</sup>			3.50 <sup>1,18</sup>		3.50 <sup>3</sup>	3.80 <sup>26</sup>	3.50 <sup>3</sup>	3.50 <sup>3</sup>	3.75 <sup>12</sup>	
4.55 <sup>1</sup>	4.55	4.55 <sup>3</sup>	4.55 <sup>3</sup>							4.55 <sup>26</sup>			
4.40 <sup>1</sup>	4.40 <sup>1</sup>	4.40 <sup>1</sup>				4.40 <sup>18</sup>				4.40 <sup>26</sup>	4.40 <sup>3</sup>	4.40 <sup>3</sup>	
5.35 <sup>1,6</sup>	5.35 <sup>1</sup>	5.35 <sup>1,3</sup>	5.35 <sup>4, 8</sup>			5.35 <sup>9</sup>				5.35 <sup>26</sup>	5.35 <sup>3</sup>	5.35 <sup>3</sup>	5.60 <sup>12</sup>
3.40 <sup>1,5,9</sup>	3.40 <sup>1,23</sup>	3.40 <sup>1,6,8</sup>					3.45 <sup>3</sup>	3.45 <sup>3</sup>		3.45 <sup>3</sup>			
5.15 <sup>1,5</sup>	5.15 <sup>1</sup>	5.15 <sup>1,6,8</sup>				5.15 <sup>6</sup>	5.20 <sup>3</sup>	5.20 <sup>3</sup>		5.20 <sup>3</sup>			
4.50 <sup>2,5,18</sup>	4.50 <sup>2,6,18, 33,34</sup>		4.50 <sup>3, 77</sup>			4.50 <sup>6</sup>	Kokomo=4.60 <sup>26</sup>			4.50 <sup>3</sup>	4.60 <sup>3</sup>	Duluth=4.50 <sup>3</sup>	Pueblo=4.75 <sup>14</sup>
4.20 <sup>1,9</sup>	4.20 <sup>1</sup>							4.20 <sup>3</sup>					

Smaller numbers indicate producing companies. See key at right.  
Prices are in cents per lb unless otherwise noted. Extras apply.

IRON AGE

**STEEL  
PRICES**

INGOTS
Carbon forging, net ton
Alloy, net ton
BILLETS, BLOOMS, SLABS
Carbon, rerolling, net ton
Carbon forging billets, net ton
Alloy net ton
PIPE SKELP
WIRE RODS
SHEETS
Hot-rolled (18 ga. & hr.)
Cold-rolled
Galvanized (10 gage)
Enameling (12 gage)
Long ternes (10 gage)
Hi Str. low alloy, h.r.
Hi Str. low alloy, c.r.
Hi Str. low alloy, galv.
STRIP
Hot-rolled
Cold-rolled
Hi Str. low alloy, h.r.
Hi Str. low alloy, c.r.
TINPLATE
Cokes, 1.50-lb base box 1.25 lb, deduct 20¢
Electrolytic 0.25, 0.50, 0.75 lb box
BLACKPLATE, 29 gage Holloware enameling
BARS
Carbon steel
Reinforcing
Cold-finished
Alloy, hot-rolled
Alloy, cold-drawn
Hi Str. low alloy, h.r.
PLATE
Carbon steel
Floor plates
Alloy
Hi Str. low alloy
SHAPES, Structural
Hi Str. low alloy
MANUFACTURERS' WIRE
Bright

Deduct \$1.15, 90¢ and 65¢ respectively from 1.50-lb coke base box price

4.05 <sup>23</sup>	3.85 <sup>23</sup>	3.45 <sup>4</sup> 11	SF, LA=4.15 <sup>24</sup> LA=4.18 <sup>22</sup>	Atlanta=3.80 <sup>25</sup>
4.05 <sup>23</sup>	3.85 <sup>23</sup>	3.45 <sup>4</sup> 11	SF, S=4.20 <sup>23</sup> F=4.10 <sup>19</sup>	Atlanta=3.80 <sup>25</sup>
				Putnam, Newark=4.55 <sup>29</sup>
4.55 <sup>23</sup>	4.35 <sup>23</sup>		LA=5.00 <sup>22</sup> F=4.95 <sup>19</sup>	
				Newark, <sup>29</sup> Worcester <sup>2</sup> =5.20 <sup>20</sup> Hartford=5.20 <sup>24</sup>
		8.20 <sup>11</sup>	F=6.25 <sup>19</sup>	
3.90 <sup>23</sup>		3.80 <sup>11</sup>	F=4.10 <sup>19</sup> S=4.40 <sup>23</sup> Geneva=3.50 <sup>18</sup>	Claymont=3.80 <sup>29</sup> Coatesville=3.90 <sup>21</sup> Harrisburg=4.25 <sup>23</sup>
				Harrisburg=4.55 <sup>28</sup>
			F=5.40 <sup>19</sup>	Coatesville=4.80 <sup>21</sup>
		5.35 <sup>11</sup>	F=5.95 <sup>19</sup>	Geneva=5.35 <sup>16</sup>
4.00 <sup>23</sup>	3.80 <sup>23</sup>	3.40 <sup>11</sup>	SF=3.85 <sup>22</sup> LA=4.00 <sup>24</sup> - <sup>22</sup>	Phoenixville=4.25 <sup>26</sup> Geneva=3.40 <sup>16</sup>
		5.15 <sup>11</sup>	F=4.00 <sup>19</sup> S=4.05 <sup>23</sup>	Fontana=5.75 <sup>19</sup> Geneva=5.15 <sup>16</sup>
5.10 <sup>23</sup>	4.90 <sup>23</sup>	4.50 <sup>11</sup> 11	SF, LA=5.45 <sup>24</sup> - <sup>22</sup>	Portsmouth=4.50 <sup>20</sup> Worcester=4.80 <sup>2</sup>

Notes: <sup>23</sup>Special coated mfg ternes deduct \$1.15 from 1.50-lb coke base box price.  
Can-making quality blackplate, 55 to 128-lb, deduct \$1.90 from 1.50-lb coke base box.  
<sup>24</sup>Straight lengths only from producer to fabricator.

**KEY TO STEEL PRODUCERS**

**With Principal Offices**

- 1 Carnegie-Illinois Steel Corp., Pittsburgh
- 2 American Steel & Wire Co., Cleveland
- 3 Bethlehem Steel Co., Bethlehem
- 4 Republic Steel Corp., Cleveland
- 5 Jones & Laughlin Steel Corp., Pittsburgh
- 6 Youngstown Sheet & Tube Co., Youngstown
- 7 Armco Steel Corp., Middletown, Ohio
- 8 Inland Steel Co., Chicago
- 9 Weirton Steel Co., Weirton, W. Va.
- 10 National Tube Co., Pittsburgh
- 11 Tennessee Coal, Iron & R. R. Co., Birmingham
- 12 Great Lakes Steel Corp., Detroit
- 13 Sharon Steel Corp., Sharon, Pa.
- 14 Colorado Fuel & Iron Corp., Denver
- 15 Wheeling Steel Corp., Wheeling, W. Va.
- 16 Geneva Steel Co., Salt Lake City
- 17 Crucible Steel Co. of America, New York
- 18 Pittsburgh Steel Co., Pittsburgh
- 19 Kaiser Steel Corp., Oakland, Calif.
- 20 Portsmouth Div., Detroit Steel Corp., Detroit
- 21 Lukens Steel Co., Coatesville, Pa.
- 22 Granite City Steel Co., Granite City, Ill.
- 23 Wisconsin Steel Co., South Chicago, Ill.
- 24 Columbia Steel Co., San Francisco
- 25 Copperweld Steel Co., Glassport, Pa.
- 26 Alan Wood Steel Co., Conshohocken, Pa.
- 27 Calif. Cold Rolled Steel Corp., Los Angeles
- 28 Allegheny Ludlum Steel Corp., Pittsburgh
- 29 Worth Steel Co., Claymont, Del.
- 30 Continental Steel Corp., Kokomo, Ind.
- 31 Rotary Electric Steel Co., Detroit
- 32 Laclede Steel Co., St. Louis
- 33 Northwestern Steel & Wire Co., Sterling, Ill.
- 34 Keystone Steel & Wire Co., Peoria, Ill.
- 35 Central Iron & Steel Co., Harrisburg, Pa.
- 36 Carpenter Steel Co., Reading, Pa.
- 37 Eastern Stainless Steel Corp., Baltimore
- 38 Washington Steel Corp., Washington, Pa.
- 39 Jessop Steel Co., Washington, Pa.
- 40 Blair Strip Steel Co., New Castle, Pa.
- 41 Superior Steel Corp., Carnegie, Pa.
- 42 Timken Steel & Tube Div., Canton, Ohio
- 43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
- 44 Reeves Steel & Mfg. Co., Dover, Ohio
- 45 John A. Roebling's Sons Co., Trenton, N. J.
- 46 Simonds Saw & Steel Co., Fitchburg, Mass.
- 47 McLaughlin Steel Corp., Detroit
- 48 Cold Metal Products Co., Youngstown
- 49 Thomas Steel Co., Warren, Ohio
- 50 Wilson Steel & Wire Co., Chicago
- 51 Sweet's Steel Co., Williamsport, Pa.
- 52 Superior Drawn Steel Co., Monaca, Pa.
- 53 Tremont Nail Co., Wareham, Mass.
- 54 Firth Sterling Steel & Carbide Corp., McKeesport, Pa.
- 55 Ingersoll Steel Div., Chicago
- 56 Phoenix Iron & Steel Co., Phoenixville, Pa.
- 57 Fitzsimmons Steel Co., Youngstown
- 58 Stanley Works, New Britain, Conn.
- 59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
- 60 American Cladmetals Co., Carnegie, Pa.
- 61 Cuyahoga Steel & Wire Co., Cleveland
- 62 Bethlehem Pacific Coast Steel Corp., San Francisco
- 63 Follansbee Steel Corp., Pittsburgh
- 64 Niles Rolling Mill Co., Niles, Ohio
- 65 Atlantic Steel Co., Atlanta
- 66 Acme Steel Co., Chicago
- 67 Joslyn Mfg. & Supply Co., Chicago
- 68 Detroit Steel Corp., Detroit
- 69 Wyckoff Steel Co., Pittsburgh
- 70 Bliss & Laughlin, Inc., Harvey, Ill.
- 71 Columbia Steel & Shaving Co., Pittsburgh
- 72 Cumberland Steel Co., Cumberland, Md.
- 73 La Salle Steel Co., Chicago
- 74 Monarch Steel Co., Inc., Hammond, Ind.
- 75 Empire Steel Co., Mansfield, Ohio
- 76 Mahoning Valley Steel Co., Niles, Ohio
- 77 Oliver Iron & Steel Co., Pittsburgh
- 78 Pittsburgh Screw & Bolt Co., Pittsburgh
- 79 Standard Forging Corp., Chicago
- 80 Driver Harris Co., Harrison, N. J.
- 81 Detroit Tube & Steel Div., Detroit
- 82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
- 83 Sheffield Steel Corp., Kansas City
- 84 Plymouth Steel Co., Detroit
- 85 John A. Roebling's Sons Co., Trenton, N. J.

FOUNDED 1855

STAINLESS STEELS

Product	Base prices, in cents per pound, f.o.b. producing point									
	301	302	303	304	316	321	347	410	416	430
Ingots, rolling	13.75	14.50	16.00	15.50	23.75	19.25	21.00	12.25	14.25	12.50
Slabs, billets, rolling	18.00	19.25	21.25	20.25	31.25	25.50	27.75	18.00	19.50	18.25
Forg. discs, die blocks, rings	32.00	32.00	34.50	33.50	50.50	38.00	42.50	26.00	26.50	26.50
Billets, forging	25.75	25.75	27.75	27.00	40.50	30.50	34.25	21.00	21.50	21.50
Bars, wire, structures	30.00	30.00	32.50	31.50	47.50	35.50	40.00	24.50	25.00	25.00
Plates	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets	38.00	39.00	41.00	41.00	54.50	47.00	51.50	34.00	35.00	37.00
Strip, hot-rolled	26.50	27.00	31.25	29.00	47.25	35.75	40.00	22.00	29.25	23.00
Strip, cold-rolled	32.00	34.50	38.00	38.50	56.50	46.00	50.00	26.50	35.00	29.00

STAINLESS STEEL PRODUCING POINTS—Sheets: Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38, 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 46. Strip: Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38; W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, 13; Butler, Pa., 7. Bars: Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 69; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67. Wire: Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28. Structures: Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44. Plates: Brackenridge, Pa., 28; Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4. Forged discs, die blocks, rings: Pittsburgh, 1, 17; Syracuse, 17; Ferndale, Mich., 28. Forging billets: Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1.

ELECTRICAL SHEETS

22 gage, HR cut lengths, f.o.b. mill

	Cents per lb.
Armature	6.20
Electrical	6.70
Motor	*7.95
Dynamo	8.75
Transformer 72	9.30
Transformer 65	9.85
Transformer 58	10.55
Transformer 52	11.35

PRODUCING POINTS—Beech Bottom, W. Va., 16; Brackenridge, Pa., 28; Foliansbee, W. Va., 63; Granite City, Ill., 22\*; add 0.3¢; Indiana Harbor, Ind., 8; Mansfield, Ohio, 75; Niles, Ohio, 64, 76; Vandergrift, Pa., 1; Warren, Ohio, 4; Zanesville, Ohio, 7.

MERCHANT WIRE PRODUCTS

	Base Column Pittsburgh, Calif.
To dealers, f.o.b. mill	
Standard & coated nails* 106	125*
Woven wire fence†	116
Fence posts, carloads†	116
Single loop bale ties	113
Galvanized barbed wire**	126
Twisted barbless wire	126

\* Pgh., Chi., Duluth; Worcester, 6 columns higher; Houston, 8 columns higher; Kansas City, 12 columns higher. † 15 1/2 gage and heavier. \*\* On 80 rod spools, in carloads. † Duluth, Joliet; Johnstown, 112.

Base per Pittsburgh,  
100 lb  
Calif.

Merch. wire annealed†	\$5.25
Merch. wire, galv.†	6.50
Cut nails, carloads†	6.75

† Add 3¢ at Worcester; 2¢ at Chicago; 1¢ at Sparrows Pt.  
† Less 2¢ at jobbers.  
† Torrance 126.

PRODUCING POINTS — Standard, Coated or galvanized nails, woven wire fence, bale ties, and barbed wire: Alabama City, Ala., 4; Atlanta, 65; Alliquippa, Pa., (except bale ties), 5; Bartonsville, Ill. (except bale ties), 34; Chicago, 4; Donora, Pa., 2; Duluth, 3; Fairfield, Ala., 11; Johnstown, Pa. (except bale ties), 3; Joliet, Ill., 3; Kokomo, Ind., 30;

Base prices, in cents per pound, f.o.b. producing point

Numbers after producing points correspond to steel producers. See key on Steel Price page.

PIPE AND TUBING

Base discounts, f.o.b. mills  
Base price about \$200.00 per net ton

Standard, T & C

Steel, Butt-weld*	Black	Galv
1/2-in. ....	40 1/2 to 38 1/2	21 to 19
3/4-in. ....	43 1/2 to 41 1/2	25 to 23
1-in. ....	46 to 44	28 to 26
1 1/4-in. ....	46 1/2 to 44 1/2	28 1/2 to 26 1/2
1 1/2-in. ....	47 to 45	29 to 27
2-in. ....	47 1/2 to 45 1/2	29 1/2 to 27 1/2
2 1/2 to 3-in. ....	48 to 46	30 to 28

Steel, lapweld

2-in. ....	38	19 1/2
2 1/2 to 3-in. ....	42	23 1/2
3 1/2 to 6-in. ....	43 to 40	24 1/2 to 21 1/2

Steel, seamless

2-in. ....	36	17 1/2
2 1/2 to 3-in. ....	39	20 1/2
3 1/2 to 6-in. ....	41	22 1/2

Wrought iron, butt-weld

1/2-in. ....	+26 1/2	+56
3/4-in. ....	+16 1/2	+45
1 & 1 1/4-in. ....	+10 1/2	+36
1 1/2-in. ....	+4 1/2	+32 1/2
2-in. ....	+4	+32

Wrought iron, lapweld

2-in. ....	+13 1/2	+40
2 1/2 to 3 1/2-in. ....	+11	+35 1/2
4-in. ....	+6	+29 1/2
4 1/2 to 8-in. ....	+8	+21
9 to 12-in. ....	+18	+40 1/2

Extra Strong, Plain Ends

Steel, butt-weld

1/2-in. ....	39 1/2 to 37 1/2	21 1/2 to 19 1/2
3/4-in. ....	43 1/2 to 41 1/2	25 1/2 to 23 1/2
1-in. ....	45 1/2 to 43 1/2	28 1/2 to 26 1/2
1 1/4-in. ....	46 to 44	29 to 27
1 1/2-in. ....	46 1/2 to 44 1/2	29 1/2 to 27 1/2
2-in. ....	47 to 45	30 to 29
2 1/2 to 3-in. ....	47 1/2 to 45 1/2	30 1/2 to 28 1/2

Steel, lapweld

2-in. ....	37	19 1/2
2 1/2 to 3-in. ....	42	24 1/2
3 1/2 to 6-in. ....	44 1/2 to 41 1/2	27 to 24

Steel, seamless

2-in. ....	35	17 1/2
2 1/2 to 3-in. ....	38	21 1/2
3 1/2 to 6-in. ....	42 1/2	25

Wrought iron, butt-weld

1/2-in. ....	+22	+56
3/4-in. ....	+15 1/2	+43
1 to 2 in. ....	+5	+32

Wrought iron, lapweld

2-in. ....	+10 1/2	+26 1/2
2 1/2 to 4-in. ....	+1	+25
4 1/2 to 6-in. ....	+5	+29 1/2
7 & 8-in. ....	list	+24 1/2
9 to 12-in. ....	+11 1/2	+32 1/2

For threads only, butt-weld, lapweld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt-weld, lapweld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lapweld and seamless 3 1/2-in. and larger four points higher discount (lower price) applies. On butt-weld lapweld steel pipe, jobbers are granted a discount of 5¢ per ft. Fontana, Calif., deduct 11 points from figures in left columns.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut lengths 10 to 24 ft inclusive.

OD	gage	Seamless	Electric	Weld	
in.	BWG	H.R.	C.R.	H.R.	C.D.
2	13	\$20.61	\$24.24	\$19.99	23.51
2 1/2	12	27.71	32.55	26.88	31.80
3	12	30.82	36.27	29.90	35.18
3 1/2	11	32.52	45.38	37.36	42.99
4	10	47.82	56.25	46.39	54.86

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.  
(Metropolitan area delivery, add 20¢ to base price except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul (\*), add 15¢; Philadelphia, add 25¢).

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS				
	Hot-Rolled	Cold-Rolled (18 gauge)	Galvanized (10 gauge)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4115 As-rolled	Hot-Rolled, A 4148 Ann.	Cold-Drawn, A 4618 As-rolled	Cold-Drawn, A 4140 Ann.	
Baltimore.....	5.18	6.391	6.551	5.59-	....	5.40-	5.69	5.59	6.19	9.69	9.69	11.12	11.49	
Birmingham*.....	5.15 <sup>10</sup>	6.05	6.15 <sup>11</sup>	6.15 <sup>11</sup>	....	5.40	5.25	5.10	6.88	....	....	....	....	
Boston.....	5.75	6.55 <sup>12</sup>	6.94 <sup>12</sup>	5.70	6.90-	6.08	5.75	5.80	6.19-	9.70-	8.50-	11.15	11.45	
Buffalo.....	5.15	6.05	6.04	5.41	7.27	5.65	5.35	5.15	5.75	9.60	9.60	11.05	11.35	
Chicago.....	5.15	6.20	6.85	5.10	6.30	5.40	5.25	5.10	5.85	9.25	9.55	10.70	11.00	
Cincinnati*.....	5.42-	5.99-	6.39	5.38	....	5.79	5.64	5.35-	5.96-	9.60-	9.90	11.05-	11.35-	
Cleveland.....	5.97	6.24	6.39	7.14	6.85	6.08	5.75	5.80	6.00	9.57	10.00	11.20	11.58	
Detroit.....	5.15	5.95	7.00-	5.24	6.35	5.62	5.37	5.12	5.75	9.36	9.66	10.81	11.11	
Houston.....	6.00	....	....	6.10	....	6.00	5.95	6.10	7.80	10.35-	10.50-	11.50	11.95	
Indianapolis.....	....	....	....	....	7.36	....	....	....	6.15	....	....	....	....	
Kansas City.....	5.75	6.55	7.48	5.70	6.95	6.00	5.85	5.70	6.35	9.65	10.15	11.30	11.60	
Los Angeles.....	5.90	7.45	8.00 <sup>2</sup>	5.95	8.70 <sup>13</sup>	6.00	5.90	5.90	7.55	10.75	10.75	12.45	12.75	
Memphis.....	5.93	6.68	....	5.98	6.80-	6.08	5.93	5.98	6.51	....	....	....	....	
Milwaukee.....	5.29	6.09	6.94-	6.99	5.24	6.32	5.54	5.39	5.24	5.89	9.39	9.69	10.84	11.14
New Orleans*.....	5.50 <sup>1</sup>	6.75	....	5.55 <sup>1</sup>	6.80	5.65	5.55 <sup>1</sup>	5.55 <sup>1</sup>	6.75	....	....	....	....	
New York.....	5.55	6.89 <sup>1</sup>	7.20 <sup>2</sup>	5.84	6.78	5.90	5.65	5.75	6.44	9.60	9.90	11.05	11.35	
Norfolk.....	6.10 <sup>13</sup>	7.00	....	6.30 <sup>13</sup>	....	6.15 <sup>13</sup>	6.20 <sup>13</sup>	6.15 <sup>13</sup>	7.20 <sup>13</sup>	....	....	....	....	
Philadelphia*.....	5.30	6.35	6.80	5.65	6.29	5.85	5.45	5.65	6.21	9.35	9.65	10.80	11.10	
Pittsburgh.....	5.15	5.95	6.80	5.20	5.95-	5.35	5.25	5.10	5.75	9.25	9.55	10.70	11.00	
Portland.....	6.60-	8.40 <sup>2</sup>	....	6.85 <sup>9</sup>	....	6.40 <sup>9</sup>	6.50	6.45-	8.80 <sup>14</sup>	12.00 <sup>14</sup>	11.60 <sup>14</sup>	....	....	
Salt Lake City.....	5.85	6.70	....	7.45	8.75	8.10 <sup>3</sup>	5.90	7.35 <sup>8</sup>	8.75	....	....	....	....	
San Francisco*.....	6.20	7.80 <sup>2</sup>	7.85 <sup>2</sup>	6.15	7.85 <sup>10</sup>	6.10	6.00	6.00	7.55	10.75	10.75	12.45	12.75	
Seattle.....	6.60 <sup>4</sup>	8.15 <sup>2</sup>	8.40 <sup>2</sup>	6.85 <sup>4</sup>	....	6.35 <sup>4</sup>	6.20 <sup>4</sup>	6.35 <sup>4</sup>	8.50 <sup>14</sup>	....	11.60 <sup>14</sup>	....	13.60 <sup>14</sup>	
St. Louis.....	5.48	6.28	7.18	5.43	6.68-	5.73	5.58	5.43	6.08	9.58	9.58	11.03	11.33	
St. Paul*.....	5.71	6.51	7.41	5.68	6.16-	5.98	5.81	5.68	6.31	9.81	10.11	11.26	11.56	

BASE QUANTITIES: (Standard unless otherwise keyed on prices.)

Hot-rolled sheets and strip, hot rolled bars and bar shapes, structural shapes, plate, galvanized sheets and cold-rolled sheets: 2000 to 3999 lb. Cold-finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb.

All HR products may be combined to determine quantity bracket. All galvanized sheets may be combined to determine quantity bracket. CR sheets may not be combined with each other or with galv. sheets to determine quantity bracket.

Exceptions:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 999 lb; (5) 2000 to 5999 lb; (6) 1000 lb and over; (7) 500 to 1499 lb; (8) 400 lb and over; (9) 400 to 9999 lb; (10) 500 to 9999 lb; (11) 400 to 3999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 9999 lb; (16) 6000 lb and over; (17) up to 1999 lb; (18) 1000 to 4999 lb; (19) 1500 to 3499 lb; (20) CR sheets may be combined for quantity; (21) 3 to 24 bundles.

PIG IRON PRICES

Dollars per gross ton. Delivered prices do not include 3 pct tax on freight.

PRODUCING POINT PRICES					DELIVERED PRICES (BASE GRADES)								
Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.	Consuming Point	Producing Point	Rail Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Baltimore.....	48.00	48.50	49.00	49.00	....	Boston.....	Everett.....	\$0.50 Arb.	50.50	51.00	51.00	....	....
Birmingham.....	41.88	42.30	42.80	42.80	....	Boston.....	Steelton.....	6.90	52.79	53.29	53.79	....	80.90
Buffalo.....	46.00	46.50	47.00	47.00	....	Brooklyn.....	Bethlehem.....	4.28	52.79	53.29	53.79	....	....
Chicago.....	46.00	46.50	46.50	47.00	....	Cincinnati.....	Birmingham.....	6.70	48.58	49.08	....	....	....
Cleveland.....	46.00	46.50	46.50	47.00	51.00	Jersey City.....	Bethlehem.....	2.63	51.13	51.63	52.13	....	....
Daingerfield, Tex.....	41.50	42.00	42.00	42.00	....	Los Angeles.....	Geneva-Ironton.....	7.70	53.70	54.20	....	....	....
Duluth.....	46.00	46.50	46.50	47.00	....	Mansfield.....	Cleveland-Toledo.....	3.33	49.33	49.83	50.33	54.33	....
Erie.....	46.00	46.50	46.50	47.00	....	Philadelphia.....	Bethlehem.....	2.39	50.39	50.89	51.39	51.89	....
Everett.....	46.00	50.50	51.00	51.00	....	Philadelphia.....	Swedeland.....	1.44	51.44	51.94	52.44	52.94	....
Granite City.....	47.90	48.40	48.90	48.90	....	Philadelphia.....	Steelton.....	3.09	51.09	51.59	52.09	52.59	57.09
Ironon, Utah.....	46.00	46.50	46.50	46.50	....	Rochester.....	Buffalo.....	2.63	48.63	49.13	49.63	....	....
Pittsburgh.....	46.00-	46.50-	46.50-	47.00-	50.00-	San Francisco.....	Geneva-Ironton.....	7.70	53.70	54.20	....	....	....
Geneva, Utah.....	46.00	46.50	46.50	47.00	....	Seattle.....	Geneva-Ironton.....	7.70	53.70	54.20	....	....	....
Sharpville.....	46.00	46.50	49.00	49.50	54.00	St. Louis.....	St. Louis.....	0.75 Arb.	48.65	49.15	49.65	....	....
Steelton.....	46.00	46.50	49.00	49.50	54.00	Granite City.....	Syracuse.....	3.58	49.58	50.08	50.58	....	....
Spruethers, Ohio.....	46.00	50.50	51.00	51.50	....	Buffalo.....	....	....	....	....	....	....	....
Toledo.....	46.00	46.50	46.50	47.00	....	....	....	....	....	....	....	....	....
Wey, N. Y.....	46.00	46.50	49.00	49.00	54.00	....	....	....	....	....	....	....	....
Youngstown.....	46.00	46.50	46.50	47.00	....	....	....	....	....	....	....	....	....

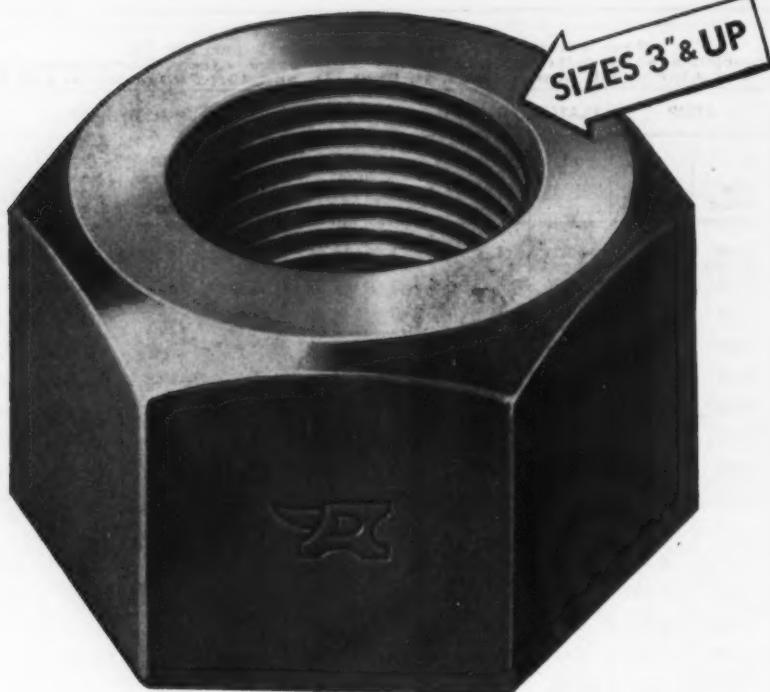
Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pet silicon content in excess of base grade which is 1.75 to 2.25 pet for foundry iron); phosphorus differentials, a reduction of 35¢ per ton for phosphorus content of 0.70 pet and over; manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pet manganese

content in excess of 1.00 pet. 82 per ton extra may be charged for 0.5 to 0.75 pet nickel content and 81 per ton extra for each additional 0.25 pet nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pet C/L per g.t., f.o.b. Jackson, Ohio—\$57.00; f.o.b. Buffalo, \$58.25. Add \$1.00 per ton for each additional 0.50 pet Si up to 17 pet.

Add 50¢ per ton for each 0.50 pet Mn over 1.00 pet. Add \$1.00 per ton for 0.75 pet or more P. Bessemer ferrosilicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$60.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$65.56. High phosphorus charcoal pig iron is not being produced.



## DYSON **LARGE** NUTS

*have tremendous holding power!*



*Sharp angles and clean, unvarying surfaces provide an accurate mating fit with the bolt*

● Dyson Large Nuts have tremendous holding power on large units of machinery and equipment. That's because they're carefully forged in flat die hammers to provide greater resistance to shock and strain. In addition, Dyson Large Nuts are threaded on special, modern hob milling equipment. This equipment gives the threads a larger contact area and greater holding power since variations in thread angles and spacing are greatly reduced.

Dyson Large Nuts are fabricated to your exact specifications...from carbon and alloy steels...to any heat treating or machining requirement. We can make prompt delivery on all standard, as well as special types of large nuts. Wire, write, or phone the factory about your requirements.

LARGE FORGED NUT DIVISION

**JOS. DYSON & SONS, INC.**

5125 ST. CLAIR AVE. • CLEVELAND 14, OHIO



### BOLTS, NUTS, RIVETS, SET SCREWS

#### Consumer Prices

(Bolts and nuts, f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)  
Base discount

#### Machine and Carriage Bolts

	Pet Off List	Lens	Case C.
1/8 in. & smaller x 6 in. & shorter	27	38	
9/16 & 5/8 in. x 6 in. & shorter...	29	40	
3/4 in. & larger x 6 in. & shorter...	26	37	
All diam, longer than 6 in. ....	22	34	
Lag, all diam, longer than 6 in. ....	28	39	
Lag, all diam x 6 in. & shorter...	30	41	
Plow bolts .....	40	—	

#### Nuts, Cold Punched or Hot Pressed

(Hexagons or Square)

1/8 in. and smaller.....	25	37	
9/16 to 5/8 in. ....	23	35	
3/4 to 1 1/2 in. inclusive.....	23	35	
1 1/2 in. and larger.....	16	29	

#### Semifinished Hexagon Nuts

(Less case lots)

	Pet Off List	Reg	Hvy	Lt
1/8 in. and smaller.....	41	35	41	
9/16 to 5/8 in. ....	36	30	36	
3/4 to 1 1/2 in. ....	31	27	33	
1 1/2 in. and larger.....	21	17	—	

In full case lots, 15 pet additional discount.

#### Stove Bolts

#### Pet Off List

Packaged, steel, plain finish..	63	
Packaged, plated finish.....	50	
Bulk, plain finish**.....	69	

\* Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

\*\* Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

#### Large Rivets

(1 1/2 in. and larger)  
Base per 100 lb

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.	\$7.25
---	--------

#### Small Rivets

(7/16 in. and smaller)  
Pet Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	43
---	----

#### Cap and Set Screws

(In bulk) Pet Off List

Hexagon head cap screws, coarse or fine thread, 1/4 in. thru 1/2 in. x 6 in., SAE 1020, bright.....	60
1/4 in. through 1/2 in. x 6 in. and shorter high C heat treated.....	54
Milled studs .....	23
Flat head cap screws, listed sizes....	24
Fillister head cap, listed sizes.....	43
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. and shorter	55

#### C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.50¢
0.41 to 0.60 carbon.....	5.95¢
0.61 to 0.80 carbon.....	6.55¢
0.81 to 1.05 carbon.....	8.50¢
1.06 to 1.35 carbon.....	10.80¢

Worcester, add 0.30¢.

#### LAKE SUPERIOR ORES

(51.50% Fe; natural content, delivered lower lake ports)  
Per gross ton

Old range, bessemer.....	\$8.10
Old range, nonbessemer.....	7.95
Mesabi, bessemer .....	7.85
Mesabi, nonbessemer .....	7.70
High phosphorus .....	7.70

After Jan. 25, 1950, increases or decreases in Upper Lake rail freight, dock handling charges and taxes are for buyers' account.

### ELECTRODES

Cents per lb, f.o.b. plant, threaded electrodes with nipples, unboxed

Diam. in. in.	Length in. in.	Cents Per lb
<b>GRAPHITE</b>		
17, 18, 20	60, 72	17.00¢
8 to 16	48, 60, 72	17.00¢
7	48, 60	18.64¢
6	48, 60	19.95¢
4, 5	40	20.48¢
3	40	21.53¢
2 1/2	24, 30	22.08¢
2	24, 30	24.15¢
<b>CARBON</b>		
40	100, 110	7.65¢
35	65, 110	7.65¢
30	65, 84, 110	7.65¢
24	72 to 104	7.65¢
20	84, 90	7.65¢
17	60, 72	7.65¢
14	60, 72	8.16¢
10, 12	60	8.42¢
8	60	8.67¢

### CLAD STEEL

Base prices, cents per pound, f.o.b. mill

Stainless-carbon	Plate	Sheet
No. 304, 20 pct.		
Coatesville, Pa. (21) . . . . .	*26.50	
Washington, Pa. (39) . . . . .	*26.50	
Claymont, Del. (29) . . . . .	*26.50	
Conshohocken, Pa. (26) . . . . .	24.00	
New Castle, Ind. (55) . . . . .	*26.50	25.50
Nickel-carbon		
10 pct, Coatesville (21) . . . . .	31.00	
Inconel-carbon		
10 pct, Coatesville (21) . . . . .	39.00	
Monei-carbon		
10 pct, Coatesville (21) . . . . .	32.00	
No. 302 Stainless-copper-stainless		
stainless, Carnegie, Pa. (60) . . . . .	75.00	
Aluminized steel sheets, hot dip, Butler, Pa. (7) . . . . .	7.75	

\* Includes annealing and pickling, or sandblasting.

### TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	Base per lb
18	4	1	—	—	\$1.00
18	4	1	—	5	\$1.565
18	4	2	—	—	\$1.12
1.5	4	1.5	8	—	71.5¢
6	4	2	6	—	76.5¢
High-carbon-chromium . . . . .					
57.5¢					
Oil hardened manganese . . . . .					
32¢					
Special carbon . . . . .					
29.5¢					
Extra carbon . . . . .					
24.5¢					
Regular carbon . . . . .					
21¢					
Warehouse prices on and east of Mississippi are 2 1/4¢ per lb higher. West of Mississippi, 4 1/4¢ higher.					

### COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsburg, Pa. . . . .	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsburg, Pa. . . . .	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd . . . . .	\$24.00
Chicago, f.o.b. . . . .	21.00
Detroit, f.o.b. . . . .	20.40
New England, del'd . . . . .	23.40
Seaboard, N. J., f.o.b. . . . .	22.00
Philadelphia, f.o.b. . . . .	21.25
Swedenland, Pa., f.o.b. . . . .	21.20
Painesville, Ohio, f.o.b. . . . .	21.90
Erie, del'd . . . . .	\$21.04 to 21.25
Cleveland, del'd . . . . .	22.62
Cincinnati, del'd . . . . .	22.71
St. Paul, f.o.b. . . . .	21.00
St. Louis, del'd . . . . .	22.18
Birmingham, del'd . . . . .	20.20

### FLUORSPAR

Washed gravel fluorpar, f.o.b. cars, Rosciare, Ill. Base price, per ton net; Effective CaF<sub>2</sub> content:

70% or more . . . . . \$39.00

60% or less . . . . . \$36.00

Prices Continued on Page 154

**AMERICAN CHAIN**

**FITTINGS • ATTACHMENTS • ASSEMBLIES**

The advertisement features a large, dark, drop-forged hook in the center, with the brand name "ACCO" embossed on its shank. Below it, several smaller fittings and attachments are shown, including a slip hook, a clevis, and a chain link. The background is dark with a textured, brush-stroke effect.

**● The uniformly high quality of AMERICAN WELDED AND WELDLESS CHAIN is reflected in all AMERICAN CHAIN products. Shown here are ACCO Drop Forged Grab Hook and Slip Hook and a few of many items your American Chain distributor either carries in stock or can quickly get for you.**

**In addition to these, a complete line of ACCO Registered Sling Chains and other factory-made assemblies is available through your American Chain distributor.**

**Buy AMERICAN—  
the complete line of chain and chain products**

**ACCO**



AMERICAN CHAIN DIVISION  
AMERICAN CHAIN & CABLE

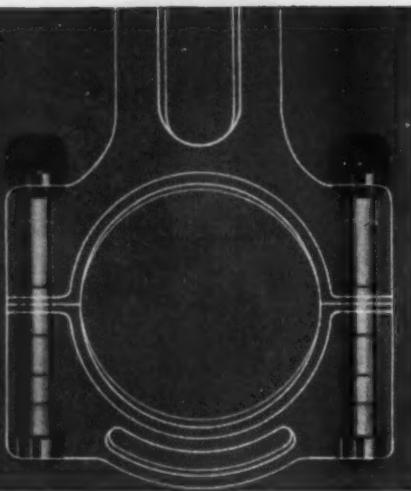
In Business for Your Safety



# SPECIFY

Connecting  
Rod

## BOLTS



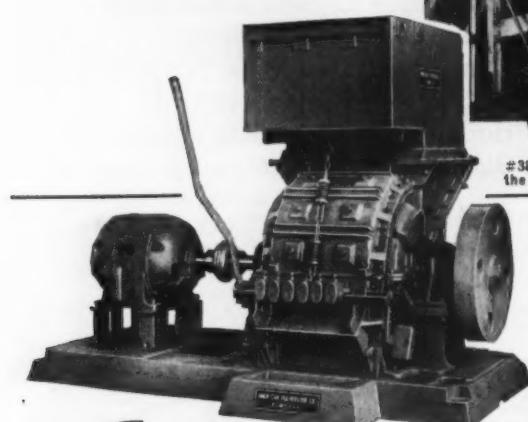
Send your specifications for precision bolting to **ERIE**, headquarters for special bolting since 1913. This long experience with alloys, steels, latest heat treatment and most rigid machining and threading tolerances is at your service. It pays to entrust vital bolting to folks who do this kind of work day in and day out. Hundreds of heavy machinery manufacturers like to do business with **ERIE**. Try **ERIE** for your next special bolting requirement.



"Representation in Principal Cities"

## SOLVE SCRAP PROBLEMS PROFITABLY

with an  
**AMERICAN RING**  
METAL TURNINGS  
**CRUSHER**



Reduced into uniform chips by American shredder ring action, long, curly turnings of steel, aluminum, brass, etc., release valuable cutting oil much more freely—30 to 50 gallons per ton! Add the savings in storage and handling—plus the higher scrap value of short shoveling turnings—and it's easy to see why Americans pay for themselves . . . over and over again.

Send for your copy of  
"Crushing Turnings Profitably."



Metal turnings reduced to uniform chips by an American #3800 Crusher are collected for oil reclamation at the Link-Belt Co.'s Ewart Plant, Indianapolis.

**American**  
PULVERIZER COMPANY  
Originators and Manufacturers of  
Ring Crushers and Pulverizers

1439 MACKLIND AVE.  
ST. LOUIS 10, MO.

IRON AGE MARKETS & PRICES  
FOUNDED 1855

### REFRACTORIES

	(F.o.b. works)	Carloads, Per 1000
First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add \$5)	\$86.00	
No. 1 Ohio	80.00	
Sec. quality, Pa., Md., Ky., Mo., Ill.	90.00	
No. 2 Ohio	72.00	
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	14.00	

### Silica Brick

Mt. Union, Pa., Ensley, Ala.	\$36.00
Childs, Pa.	90.00
Hays, Pa.	91.00
Chicago District	95.00
Western Utah and Calif.	101.00
Super Duty, Hays, Pa., Athens, Tex., Chicago	106.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	15.00
Silica cement, net ton, bulk, Hays, Pa.	17.00
Silica cement, net ton, bulk, Ensley, Ala.	16.00
Silica cement, net ton, bulk, Chicago District	16.00
Silica cement, net ton, bulk, Utah and Calif.	32.50

### Chrome Brick

	Per Net Ton
Standard chemically bonded, Balt., Chester	\$72.00

### Magnesite Brick

Standard, Baltimore	\$94.00
Chemically bonded, Baltimore	83.00

### Grain Magnesite

	St. 3/4-in. grains
Domestic, f.o.b. Baltimore, in bulk fines removed	\$56.00 to \$57.00
Domestic, f.o.b. Chewelah, Wash., in bulk	33.00
in sacks	33.00

### Dead Burned Dolomite

F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢	\$13.00
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### METAL POWDERS

Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.

Swedish sponge iron, c.i.f. New York, ocean bags	7.4¢ to 9.0¢
Canadian sponge iron, del'd, in East	10.00¢
Domestic sponge iron, 98+%	
Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 95.5% + Fe	36.0¢ to 39.5¢
Electrolytic iron unannealed, minus 325 mesh, 99+ % Fe	48.5¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe	62.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 micron, 98%, 99.5+ % Fe	70.0¢ to \$1.35
Aluminum	29.00¢
Brass, 10 ton lots	27.75¢ to 31.35¢
Copper, electrolytic	9.25¢ plus metal value
Copper, reduced	9.75¢ plus metal value
Cadmium, 100-199 lb	\$2.95
Chromium, electrolytic, 99% min. and quantity	\$3.50
Lend	6.5¢ plus metal value
Manganese	52.00¢
Molybdenum, 99%	52.65¢
Nickel, unannealed	75.5¢
Nickel, annealed	81.5¢
Nickel, spherical, unannealed	78.5¢
Silicon	34.00¢
Solder powder	6.5¢ to 8.5¢ plus met. value
Stainless steel, 302	75.00¢
Tin	11.00¢ plus metal value
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	20.50¢ to 23.85¢

### CAST IRON WATER PIPE

Per net ton

6 to 24-in., del'd Chicago	\$91.80 to \$95.30
6 to 24-in., del'd N. Y.	91.00 to 92.00
6 to 24-in., Birmingham	78.00 to 82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	\$108.50 to \$113.00
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

Prices Continued on Page 156

**I-T-E** removes oil, dirt, sand and filings . . . easily and quickly . . . with

# VAPOR DEGREASING

Speedy, trouble-free cleaning of a wide range of brass, copper, bronze, iron and steel parts . . . that's the 12-year performance record of vapor degreasing with trichlorethylene at the Philadelphia plant of the I-T-E Circuit Breaker Company.

The springs, nuts, bolts, washers, switch parts and housings I-T-E manufactures for its circuit breakers and switch gears must be thoroughly cleaned before finishing and inspection, and after burring and sanding. To do



Small stampings thoroughly cleaned.



Large circuit breaker housings are clean and dry—ready for further handling—after vapor degreasing.

this job simply and economically, I-T-E uses three vapor degreasers, one of which has been in service since 1937. These units deliver the parts clean, warm, and dry . . . ready for inspection or further processing.

This modern method of cleaning has fitted in perfectly with the high-speed flow of production at I-T-E. For your plant, too, the installation of vapor degreasing may mean increased production and lower costs in metal cleaning.

### USE DU PONT TRICHLORETHYLENE DEGREASING SOLVENT



Thousands of manufacturers are using Du Pont Trichlorethylene for vapor degreasing.

Under various trade marks, Du Pont degreasing solvents have been widely used for many years. These solvents are stable

. . . the best yet developed by Du Pont for metal degreasing. They stand up against contaminating and destructive materials which may be introduced in degreasing . . . assist materially in carrying out efficient cleaning.



### SEND FOR HELPFUL FREE LITERATURE

These three booklets will give you detailed information on the advantages of vapor degreasing, the equipment, industrial applications, and the Du Pont degreasing solvents.

Mail the coupon today!



E. I. du Pont de Nemours & Co. (Inc.)  
Electrochemicals Dept., Wilmington 98, Del.

Please send me your free literature covering the vapor degreasing process and solvents. We are interested in cleaning products.

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Firm \_\_\_\_\_

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non-flammable SOLVENTS  
for VAPOR DEGREASING  
SOLD NATIONALLY THROUGH DISTRIBUTORS

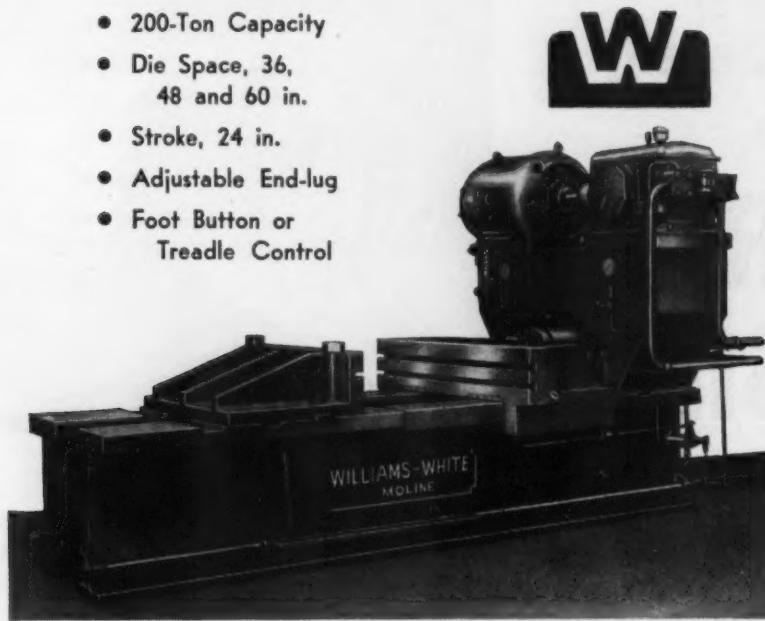


BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

## WILLIAMS-WHITE *Hydraulic BULLDOZER*

... A Versatile Horizontal Press

- 200-Ton Capacity
- Die Space, 36, 48 and 60 in.
- Stroke, 24 in.
- Adjustable End-lug
- Foot Button or Treadle Control



MAKERS OF QUALITY PRODUCTION TOOLS FOR NEARLY 100 YEARS

**WILLIAMS-WHITE & Co.**  
703 THIRD AVE., MOLINE, ILLINOIS

### Gear Unit Made Better ... but *Cheaper* with AMGEARS know-how

**Wanted** ... constant mesh 3-speed divider and multiplier transmission for 28 hp.

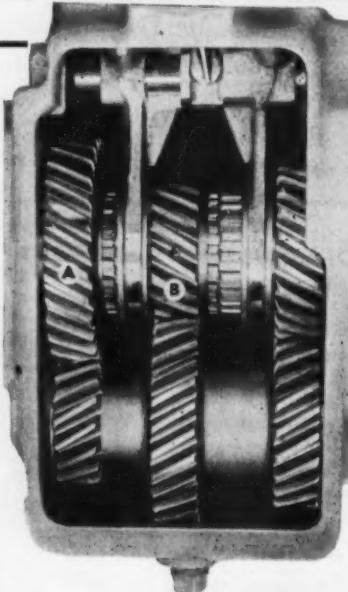
**Supplied:** Exceptionally compact unit with 2000 rpm. input, 3150 rpm. overdrive and 1060 rpm. underdrive output. Yet, no bronze bearings needed on A and B! WHY? Amgears designed the output shaft and gears A and B to rotate in same direction. Result, a relatively small difference in velocity between shaft and gear bores, with no load when velocity differences occur.

**Save** on your gear costs ... improve your products ... with AMGEARS design help as well as unparalleled gear manufacturing facilities. Write for interesting CASE HISTORIES.

**AMGEARS, INC.**

6633 West 65th Street

Chicago 38, Ill.



Production and precision spurs, sprockets, helicals, worms and wormgears; straight and spiral bevel gears and racks.

**AMGEARS,**

INC.

CHICAGO 38, ILLINOIS

A SUBSIDIARY OF HUFF CORPORATION  
CONTRACT MANUFACTURERS  
Detroit • Cleveland • Chicago

IRON AGE MARKETS & PRICES  
FOUNDED 1855

Continued

### FERROALLOYS

#### Ferromanganese

78-82% Mn. maximum contract base price, gross ton, lump size.  
F.o.b. Birmingham ..... \$174  
F.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont. ..... \$173  
F.o.b. Johnstown, Pa. ..... \$174  
F.o.b. Sheridan, Pa. ..... \$172  
F.o.b. Etna, Clairton, Pa. ..... \$175  
\$2.00 for each 1% above 82% Mn, penalty, \$2.15 for each 1% below 78%.  
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.  
Carload, bulk ..... 10.45  
Ton lots ..... 12.05

#### Spiegeleisen

Contract prices gross ton, lump, f.o.b.  
16-19% Mn 19-21% Mn  
3% max. Si 3% max. Si  
Palmerton, Pa. \$64.00 \$65.00  
Pgh. or Chicago 65.00 66.00

#### Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.  
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.  
Carload, packed ..... 35.5  
Ton lots ..... 37.0

#### Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.  
Carloads ..... 28  
Ton lots ..... 30  
Less ton lots ..... 32

#### Medium Carbon Ferromanganese

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn. .... 16.15

#### Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.  
Carloads Ton Less  
0.07% max. C, 0.05%  
P, 90% Mn ..... 25.25 27.10 28.30  
0.10% max. C ..... 24.75 26.60 27.80  
0.15% max. C ..... 24.25 26.10 27.30  
0.30% max. C ..... 23.75 25.60 26.80  
0.50% max. C ..... 23.25 25.10 26.30  
0.75% max. C, 7.00% max. Si ..... 20.25 22.10 23.30

#### Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.  
Carload bulk ..... 8.85  
Ton lots ..... 10.60  
Briquet, contract basis carlots, bulk delivered, per lb. of briquet ..... 10.80  
Ton lots ..... 11.90

#### Silvery Iron (electric furnace)

SI 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., \$77.00 gross ton, freight allowed to normal trade area SI 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., \$73.50. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.

#### Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.  
96% Si, 2% Fe ..... 20.70  
97% Si, 1% Fe ..... 21.10

#### Silicon Briquets

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 1 lb Si briquets.  
Carload, bulk ..... 6.30  
Ton lots ..... 7.90

#### Electric Ferrosilicon

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.  
25% Si ..... 17.00 75% Si ..... 13.50  
50% Si ..... 11.30 85% Si ..... 14.45  
90-95% Si ..... 16.50

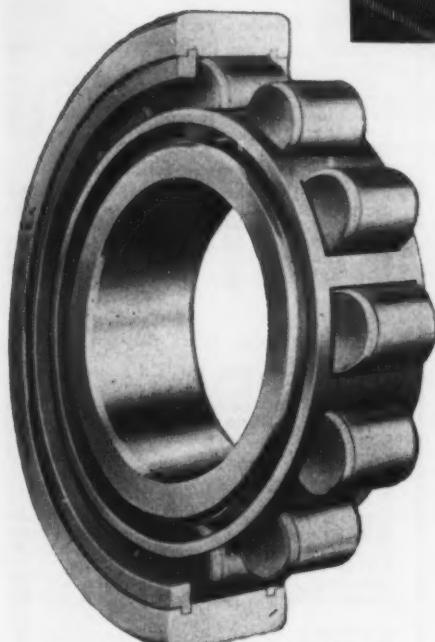
#### Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.

Cast Turnings Distilled  
Ton lots ..... \$2.05 \$2.95 \$3.75  
Less ton lots ..... 2.40 3.30 4.55

Prices Continued on Page 160

For new equipment or changeovers



## HYATTS PREFERRED

In the specifications now being prepared for the new mill tables, cars, cranes, motors, etc., you'll find more and more steel men writing in "Hyatt Equipped."

And in the extensive mill improvement programs also underway, you'll find many Hyatt Roller Bearings being "built-in" to replace obsolete plain bearings.

Proving that whether it's in the design of new equipment or for changeovers on existing equipment, steel men everywhere have learned that they can depend on Hyatts . . . the preferred steel mill bearings. Is there any application data you desire? Hyatt Bearings Division, General Motors Corporation, Harrison, N. J., Chicago, Ill. and Pittsburgh, Pa.

**HYATT ROLLER BEARINGS**

# Enthusiastic Customers do our BEST advertising

Standard Pressed Steel Co., Jenkintown, Pa., uses No. 25 Grand Rapids Hydraulic Feed Surface Grinders in making the tools and dies that produce Unbrako Socket Screw Products, Flexloc Self-Locking Nuts, Hallowell Shop Equipment.



You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
5. Portable coolant tank for ease of coolant replacement
6. Vane type hydraulic pump for fast longitudinal table travel

## GRAND RAPIDS GRINDERS

*To save you—*

Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.



200 Straight, S. W., Grand Rapids 4, Mich.

## SELECT A *Sterling* THAT FITS YOUR JOB!



(Above)

Model S-3 Maximum Capacity 3 1/2 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Steel channel legs. V-shaped front braces and brace support.

(Right)

Model S-19 Maximum Capacity 5 cu. ft. 16 gauge tray, all welded, no rivets, double lapped at corners. Heavy-duty malleable wheel guard.

There's a Sterling Barrow for every type of hauling job, whether it's dry, bulky materials like sawdust or heavy industrial loads like castings or steel parts. Also special barrows for brick, tile, coal, concrete block and similar materials. All barrows are scientifically designed, well balanced and sturdily constructed for a long service life. Choice of wood handles or tubular steel frame, steel wheels or pneumatics. Write for new Sterling Wheelbarrow Catalog No. 61.

12 SPOKE STEEL WHEEL

PNEUMATIC TIRED WHEEL

IMMEDIATE SHIPMENT



WOOD HANDLE BARROW

Look for this Mark of STERLING Quality

STERLING WHEELBARROW CO., Milwaukee 14, Wis.

**Sterling** WHEELBARROWS

## IRON AGE MARKETS & PRICES FOUNDED 1855

Continued

### Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max Si.)

0.06% C	28.75	0.20% C	27.75
0.10% C	28.25	0.50% C	27.50
0.15% C	28.00	1.00% C	27.25
2.00% C			27.00
65-69% Cr, 4-9% C			20.50
62-66% Cr, 4-6% C, 6-9% Si			21.35

### High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low-carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

### S. M. Ferrochrome

Contract price, cents per pound, chrome contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

Carloads ..... 21.60

Ton lots ..... 23.75

Less ton lots ..... 25.25

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

Carloads ..... 27.75

Ton lots ..... 30.05

Less ton lots ..... 31.85

### Chromium Metal

Contract prices, per lb chromium contained packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

0.20% Max. C ..... \$1.09

0.50% max. C ..... 1.05

.00 min. C ..... 1.04

### Low Carbon Ferrochrome Silicon

(Cr 34-41%, Si 42-49%, C 0.05% max.)

Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 20.50¢ per lb of contained Cr plus 11.30¢ per lb of contained Si.

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

### Calcium-Silicon

Contract price per lb of alloy, lump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

Carloads ..... 17.90

Ton lots ..... 21.00

Less ton lots ..... 22.50

Bulk 1-in. x down, 20.65¢ per lb contained Cr plus 11.50¢ per lb contained Si.

Contract price per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

Carloads ..... 19.25

Ton lots ..... 21.55

Less ton lots ..... 22.55

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 18.50-

16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots ..... 19.75

Less ton lots ..... 21.00

Contract price, cents per pound of alloy, delivered.

Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.

Alloy 5: 50.56% Cr, 4-6% Mn, 18.50-

16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.

Ton lots ..... 19.75

Less ton lots ..... 21.00

Contract price, cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots ..... 15.75¢

Less ton lots ..... 17.00¢

### V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

Ton lots ..... 15.75¢

Less ton lots ..... 17.00¢

Contract price, cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

Carload packed ..... 17.00¢

Ton lots to carload packed ..... 18.00¢

Less ton lots ..... 19.50¢

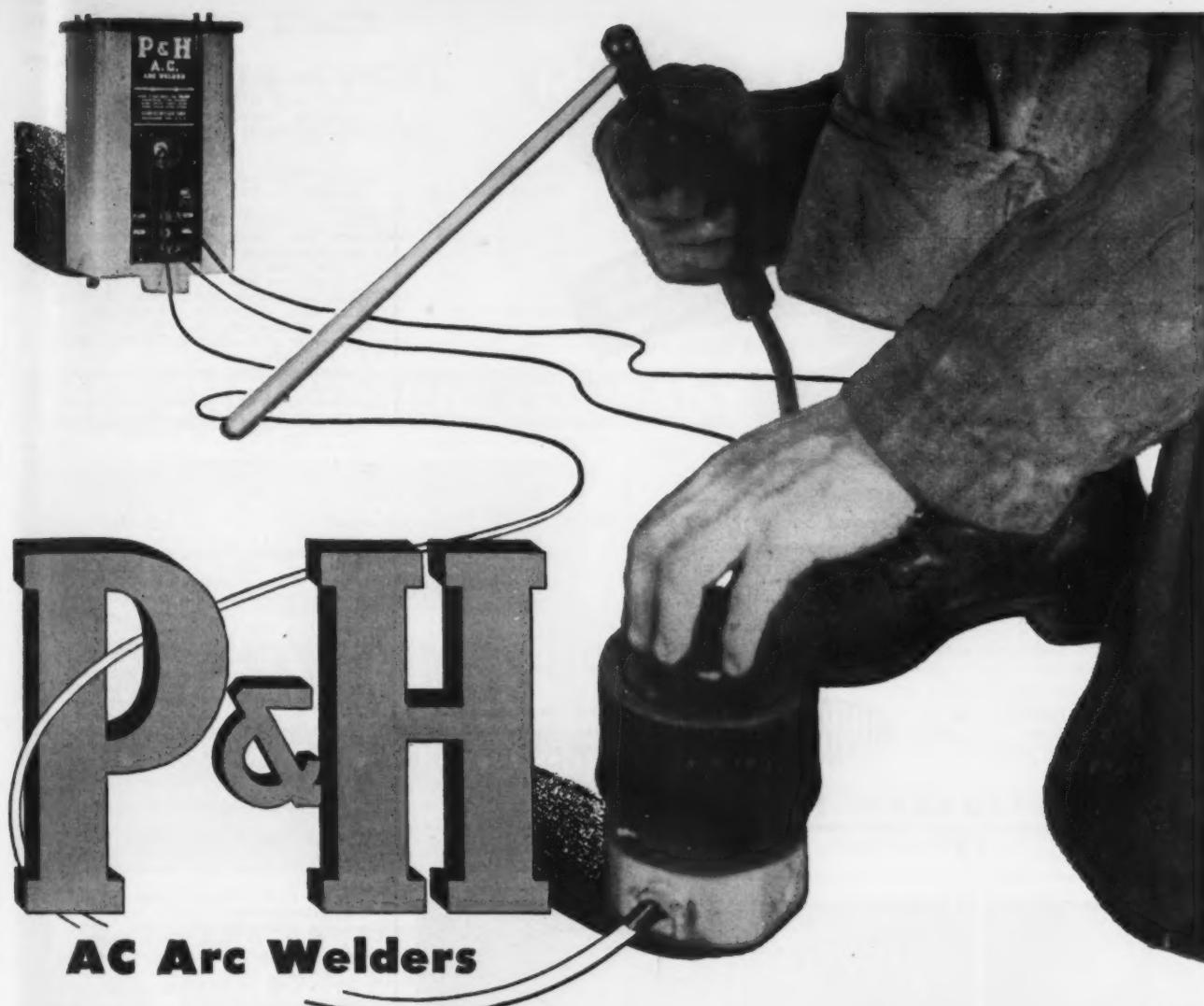
### SMZ

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, 1/4 in. x 12 mesh.

Ton lots ..... 17.25

Less ton lots ..... 18.50

Prices Continued on Page 162



**P&H**

**AC Arc Welders**



**The only Complete Line of AC  
Welders with Dial-electric Control**

Also complete line of High-Frequency Machines

Model TI-200 — Range 30 to 275 amps      Model TI-150 — Range 20 to 190 amps

Excavators • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizer • Crawler and Truck Cranes • Diesel Engines  
Cane Loaders • Pre-assembled Homes

**Exclusive Dial-electric control saves time  
and motion, cuts your welding costs**

P&H built-in remote control puts heat selection just where your operators want it — at the work. Walking time is turned into welding time. Mount the welder on the wall — save valuable floor space. Welding is faster, sounder, better looking. Production goes up, costs go down.

Additional features are: Easy quick-start arc. Elimination of arc blow. No moving parts to cause delays or maintenance expense. High electrical efficiency that reduces power costs. NEMA rated.

See your P&H representative or distributor for full details.

TEAR OUT THIS COUPON AND MAIL TODAY



Please send me additional information showing how P&H AC welders cut welding costs.

Name.....  
Company.....  
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City.....  
(...) State.....  
Title.....  
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The UNBRAKO Knurled Socket Head Cap Screw.

Ask for your copy of the UNBRAKO Catalog of Socket Screw Products.

Knurling of Socket Screws, originated with UNBRAKO in 1934.

Knurled Head Socket Cap Screws  
Flat Head Socket Cap Screws  
Self-Locking Socket Set Screws

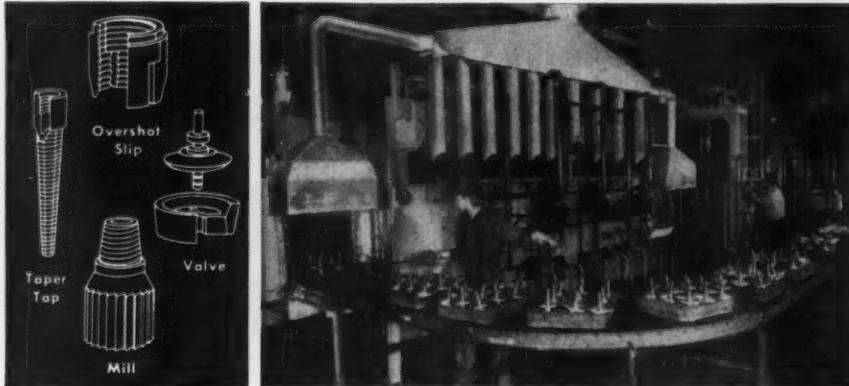
SOCKET

**UNBRAKO**

SCREWS

Knurled Head Shoulder Screws  
Precision-Ground Dowel Pins  
Fully-Formed Pressure Plugs

**-SPS** STANDARD PRESSED STEEL CO.  
JENKINTOWN 17, PENNSYLVANIA



## Gas Carburizing and other heat processing

The American Iron and Machine Works Company, of Oklahoma City, is heat treating and gas carburizing several different parts — requiring different cycles — in the equipment pictured above which consists of an EF gas-fired radiant tube pusher type furnace, equipped with endothermic gas generator, automatic quench, oil conditioner, heat exchanger, washing machine and draw furnace.

The user reports a greatly improved product, much improved production control and decreased costs. Let the EF engineers, with their wide experience in all fields of heat treating, work with you on your next job.



**THE ELECTRIC FURNACE CO.**

GAS FIRED, OIL FIRED AND ELECTRIC FURNACES  
FOR ANY PROCESS, PRODUCT OR PRODUCTION

*Salem - Ohio*

## IRON AGE MARKETS & PRICES FOUNDED 1855

Continued

### Other Ferroalloys

Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	7.65¢
Carload	3.05¢
Ton lots	3.05¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo	96¢
Ferrocolumbium, 50-60%, 2 in x D, contract basis, delivered, per pound contained Crb.	1.13¢
Ton lots	3.50¢
Less ton lots	3.55¢
Ferro-Tantalum-columbium, 20% Ta, 40% Crb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Crb plus Ta	2.67¢
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo	\$1.13
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton	\$65.00
10 tons to less carload	75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.25
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti	\$1.40
Less ton lots	\$1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton	\$167.00
Ferrotungsten, standard, lump or $\frac{1}{4}$ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Molybdc oxide, briquetes or cans, per lb contained Mo, f.o.b. Langeloth, Pa., bags, f.o.b. Washington, Pa., Langeloth, Pa.	95¢
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	94¢
Carload, bulk, lump	11.00¢
Ton lots, bulk, lump	11.50¢
Less ton lots, lump	12.25¢
Vanadium pentoxide, 88-92% $V_2O_5$ contract basis, per pound contained $V_2O_5$	\$1.20
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	\$1.00
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.	
Carload, bulk	6.60¢
<b>Boron Agents</b>	
Contract prices per lb of alloy, del. Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$1.25
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, Ti 15-21%, B 1-2%, Si 2-4%, Al 1-2%, C 4.5-7.5% f.o.b. Suspension Bridge, N. Y., freight allowed.	
Ton lots, per pound	10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots	\$1.20
F.o.b. Wash. Pa.: 100 lb, up	
10 to 14% B	.75
14 to 19% B	1.20
19% min. B	1.50
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Manganese-Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.46
Less ton lots	1.57
Nickel-Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silcaz, contract basis, delivered.	
Ton lots	45.00¢

August 17, 1950

## ALL STEEL



## BENDING ROLLS

BUILT IN THESE POPULAR SIZES:

### SERIES 400 4 1/4" ROLLS

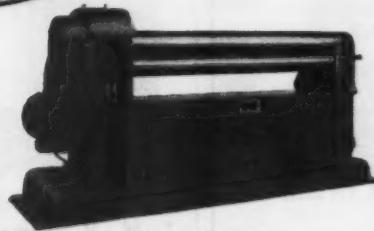
Model	Capacity
438	36" x 10 GA.
444	42" x 11 GA.
450	48" x 12 GA.
462	60" x 14 GA.
474	72" x 16 GA.

### SERIES 500 5" ROLLS

Model	Capacity
503	36" x 7 GA.
504	48" x 8 GA.
505	60" x 10 GA.
506	72" x 12 GA.
508	96" x 16 GA.

### SERIES 600 6" ROLLS

Model	Capacity
603	36" x 3/8"
604	48" x 5/16"
605	60" x 1/4"
606	72" x 3/16"
608	96" x 10 GA.



- ALL STEEL
- COMPACT
- ANTI-TORQUE FRAME
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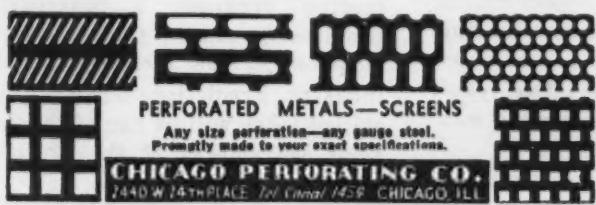


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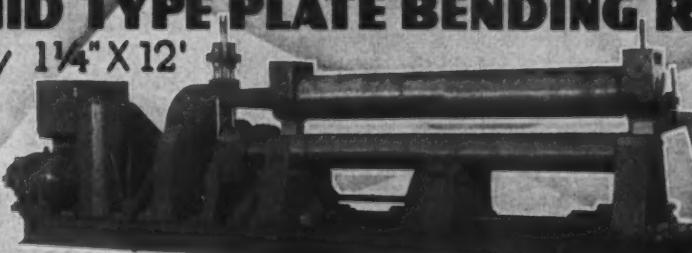
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Capacity 1 1/4" X 12'



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Our Line  
Light and heavy machinery for all classes of sheet metal, plate and structural work.

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DRILLS. 20", 21" & 24" Cincinnati  
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DRILL. No. 410 Barnes deep hole  
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GEAR HOBBER. 3, 12, A & T Barber Colman  
GEAR SHAPER. Nos. 7125A & 6 Fellows  
GEAR GENERATOR. 3" Gleason spiral  
GRINDER. No. 2 Cincinnati centerless  
GRINDER. 4x18, 6x18, 10x18, 10x36, 14x36 Landis  
GRINDER. 6"x18", 10"x36" Norton  
GRINDER. No. 1 Univ. & 10 Brown & Sharpe  
GRINDER. Nos. 228 & 230 Hanchett disc  
GRINDER. 16" & 24" Heald 25A surf.  
GRINDER. No. 34 Abrasive surface  
HONE. No. 307 Barnes  
KEYSEATER. Nos. 2 & 4 Mitts Merrill  
KEYSEATER. No. 3 Baker  
LAPPER. No. 26 Norton Hyprolap  
LATHE. 10"x20" Monarch EE  
LATHE. 14"x6" & 18"x6" Lodge Shipley  
LATHE. 25"x48" & 40"x88" Leblond  
LATHE. 36"x16" Bridgeford  
LATHE, TURRET. 24" & 36" Bullard  
LATHE, TURRET. Nos. 3, 4, 5, 3AL Gisholt  
LATHE, TURRET. Nos. 4, 1A & 3A W. & S.  
LATHE, TURRET. No. 4 Bardons Oliver  
MILLER. No. 3 Cincinnati MSDT  
MILLER. No. 2H K. & T. Univ.  
MILLER, VERT. Nos. 2M, 2, 3 & 4 Cincinnati  
MILLER, VERT. Nos. 2H & 3H K. & T.  
MILLER, R. & F. Nos. 08 & 2-18 Cincinnati  
MILLER, AUTO. 1H-12", M18, M24 & 12-24 K. & T.  
MILLER, AUTO. 1-12, 1-18, 2-18 & 2-24 Cincinnati  
MILLER, HYDROMATIC. Nos. 3-24, 3-36, 4-36, 4-48,  
34-36, 5-48, 56-72 & 56-90  
MILLERS, ROTARY. 36", 42" & 84" Ingersoll  
MILLERS, PLANETARY. Type D Hall  
MILLER, THREAD. Nos. 4, 6, 10, CT36 Lees Bradner  
PLANER. 30"x24"x6" Liberty openside  
PLANER. 36"x36"x8" Gray  
PRESS. No. 3 Consolidated OBI  
PRESS. No. 11 Toledo adj. knee  
PRESS. Nos. P1, P2, P3, P4, P5 Ferracule  
PRESS. Nos. 202B & 205C Toledo dbl. cr.  
PRESS. No. 504 Bliss High Speed  
PRESS. Nos. 73 1/2, 75 1/2, 304 Bliss S.S.  
PRESS. Nos. 1 1/2 & 1 1/2 Bliss cam draw  
PRESS. No. 52 Toledo arch frame  
PRESS. 150 ton EG52 Ferracule  
PRESS. 1000 ton No. 27K Bliss  
PRESS. 600 ton Hamilton forging  
PRESS. 100 ton H.P.M. hydraulic  
PRESS. 1000 ton Baldwin hydraulic  
RIVETERS. 1 1/2B, 3A, 5A High Speed  
ROLL. No. 18 Kane & Roach straightening  
SHEAR. 72"x14 ga. Wyson & Miles  
SHAPER. 24" Columbia Universal  
SHAPER. 16", 20", 24" & 28" G. & E.  
SHAPER. 20" & 24" Gemco universal  
TAPPER. No. 1 Baush radial arm  
TAPPER. Baush radial arm  
TAPPER. Nos. 2, 2X & 2BG Garvin  
THREADER, BOLT. 1 1/2" Murcley, No. 11  
THREADER, PIPE. 2" Landis  
UPSETTER. 4" Ajax, 2" National  
WELDER. 200 KVA Federal Flash

**MILES MACHINERY CO.**

BOX 770

SAGINAW, MICHIGAN

# The Clearing House

NEWS OF USED, REBUILT AND SURPLUS MACHINERY

**MDNA May Move**—The national headquarters of the Machinery Dealers' National Association may be moved to Washington within the next 60 days, according to J. M. P. Fox, executive director of the MDNA. The move would enable the association's staff to keep in closer touch with legislative matters affecting the industry, and with the various government agencies whose actions and rulings affect the used machinery business. Such a move would require the approval of the MDNA board of directors.

**Chicago Business Terrific**—While buyers in other areas still seem to be proceeding cautiously in the face of the Korean situation, with inquiries sharply up but orders only moderately increased, the used machinery business in the Chicago area is described by some as only slightly less than terrific. This sudden upsurge is in contrast to the situation prior to the Korean outbreak when business was spotty.

Although manufacturers have not as yet received government military orders in quantity, a lot of them, such as aircraft industry suppliers, know the orders will be coming and are already retooling. Their subcontractors are doing the same thing, with the result that buyers are rushing the market.

A good share of the buying is also due to those who had buying plans for a later date, who are now advancing those buying plans because of fear that the equipment they want will not be available at a later date.

**Films For N. Y. MDNA**—Meetings of the New York chapter of the Machinery Dealers' National Association, which begin again in September after a summer recess, will feature educational motion pictures. To be loaned by manufacturers, the films will cover the

manufacture and operation of various machine tools. At the first meeting, the film will be "From Foundry to Shipping Floor," the story of the making of Springfield lathes, loaned by the Springfield Machine Tool Co.

**Chicago Prices**—Prices in Chicago are rising rapidly and are reported by some sources to be 20 to 50 pct higher on standard general purpose machines than they were a month or two ago. Good late model machines sold at auction are bringing prices almost as high as the price of similar new equipment.

Machinery most in demand in the Chicago area includes late model toolroom equipment, and production milling machines, lathes, grinders, and drill presses.

**Labor Shortage**—The problem of rebuilding machinery has taken on a different aspect since the war situation took a turn for the worse. At one time, a number of Detroit used machinery firms dropped their rebuilding activities as being non-profitable. Recently, when efforts were made to revive this activity, or to step-up an operating program, a manpower problem developed that was anticipated by few members of the industry. Predictions now are that skilled labor will be one of the serious bottlenecks if the present upward spiral continues.

**NISA Publications**—A new list of publications available to members of the National Industrial Service Association supersedes a list dated December, 1949. Publications include "Bookkeeping Made Easy," "Rewind Data Books," "Electric Motor and Generator Rebuilding Standards and Transformer Rebuilding Standards," "Equipment Bulletin—Wanted and For Sale Listings," and copies of recent National Convention papers.